INVESTMENT GENERAL DIVISION
PROCUREMENT DIVISION

TED 047/2020
CALL FOR OPEN TENDER
FOR THE PROCUREMENT OF A TRANSTAINER FUNCTION PROGRAMMER

TENDER PROCEDURE SUMMARY DOCUMENTATION

OPEN TENDER	
ECONOMIC OPERATOR	**THESSALONIKI PORT AUTHORITY SA** Main activity: Port services Address: Inside the Port of Thessaloniki PC 54012 Thessaloniki Tel.: 2310593121, Fax: 2310510500 Email: secretariat@thpa.gr Website address: http://www.thpa.gr
Tender closing date	
Closing date to submit clarification requests	
Award criterion	Most advantageous bid based on price
Information/Clarifications	**On the tender procedure** Name: Giorgos Papageorgiou Email: gpapageorgiou@thpa.gr Name: Chrisanthi Athanasiou Email: cathanasiou@thpa.gr Tel:2310593360 **On technical issues** Name: Anastasia Sachinidou Email: asachinidou@thpa.gr Tel: 2310 593354

PART A:
GENERAL TERMS:

1.1 ARTICLE 1– Procurement object description - Object

The object of the tender is the dismantling of the installed, procurement installation and commissioning, fully operational of a new PLC control system, on the transtainer, as described in detail in Part B herein. The Contractor shall perform and be fully responsible for all necessary work for putting the transtainer back into service, including dismantling, procurement and installation of the new PLC control system , accompanied by the equipment, as described in detail in Part B of the Tender notice, re-issuance of all documents (amendment and update of all original technical sheets), drive and immobilization, furnishing equipment, procurement and installation of all materials (structural, mechanical & electrical), testing, commissioning, putting back into service, re-certification of the modified crane, and compliance with applicable European Standards and local Greek standards.
Tenderers can visit the transtainer of ThPA SA in order to be informed on the spot and learn more about the works required to carry the Tender object forward. The site visit will take place on a day and time that will be agreed upon with the Procurement Department.
Work shall also include any work not specified, but reasonably required to complete the intent of the project.
No claim will be accepted by ThPA SA for unforeseen activities aimed at upgrading and making cranes full operative according to the Standards in force and/or applicable, even if not clearly stated or highlighted in the present specifications.

- **NOTE:** It is clarified that "Procurement" shall be understood as the total number of works, materials, machinery and services required for delivering the transtainer in full and normal operation.

ARTICLE 2 - Participation right

2.1 Eligible tenderers

2.1.1. Eligible to participate in this Tender are legal persons and, in the case of an association of economic operators, the members thereof that have performed a similar project on a port electric crane, transtainer or gantry crane or on a winch, equipped with an equipment of the same type as the one supplied.

2.1.2. Tenderers must:

- Not be in a state of bankruptcy, liquidation or compulsory receivership.
- Not be convicted by means of a final judgement for the offences listed below. In the case of Limited Liability Companies, Private Companies and Limited or General Liability Partnerships, this requirement refers to the Administrators. In the case of Société Anonymes, this requirement refers to the Chairman and CEO. In all other cases, this requirement refers to the natural persons managing the company.
  a) Participation in a criminal organisation, as defined in Article 2(1) of Council Joint Action No. 98/733/JHA.
  b) Bribery, as defined in Article 3 of the Council Act of 26 May 1997(21) and Article 3(1) of Council Joint Action 98/742/JHA.
  c) Fraud within the meaning of Article 1 of the Convention relating to the protection of the financial interests of the European Communities.
  d) Money laundering, as defined in Article 1 of Council Directive No. 91/308/EEC, on the prevention of the use of the financial system for the purpose of money laundering.
  e) embezzlement (article 375 of the Criminal Code)
  f) fraud (article 386-388 of the Criminal Code)
  g) extortion (article 385 of the Criminal Code)
  h) forgery (article 216-218 of the Criminal Code)
  i) perjury (article 224 of the Criminal Code)
  j) bribery (article 235-237 of the Criminal Code)
  k) bankruptcy fraud (article 398 of the Criminal Code)

In case of Union or Joint Venture, the above must met by easch member of the Joint Venture.
In case of Union or Joint Venture, all the members will be jointly and severally liable to the contracting entity.

2.1.3 Tenderers must submit a "General Personal Injury & Damage to Property Civil Liability and Employer Civil Liability" insurance policy. The total amount of the compensation of General Civil Liability for the total of coverage amounts to at least two hundred and fifty thousand euros (250.000,00€)

2.2 Quality Selection Criteria– Professional capacity

To participate in the Tender, Interested Economic Operators **must fulfil** all the following requirements regarding their technical and professional skills:

1. They need to have at least t**wo (2) Electricians/Electronic Engineers** with over 5 years experience and holders of the relevant professional license.

2. They must have the know-how and experience in the execution of similar contracts, that they can demonstrate sufficiently and have experience in the provision of services: On electric cranes, transtainers or gantry cranes or on a winch equipped with an equipment of the same type as the one they provide.

3. They must have the necessary equipment, personnel to provide direct support mandated by the Supplier or his representative, the possibility of having a technical crew in Thessaloniki to provide technical support to the equipment or, failing that, a technical crew in Greece.

4. Interested Economic Operators must have an EN ISO 9000 Certificate or equivalent, issued by a recognized Institution or Body, established at an EU Member State, or other proof of equivalent quality assurance measures.

In the event that Interested Economic Operators participate as a Union or a Joint Venture, the above requirements must be met cumulatively by the members of the joint venture.

2.3 SUPPORTING DOCUMENTS FOR PROVING THE TENDERER'S PROFESSIONAL CAPACITY

In order to document their professional capacity and experience, Tenderers shall submit along with the participation documents:

- A Table presenting their experience in the execution of similar contract; apart from the titles of the projects, the table must specify the contractual delivery time and the actual delivery time of the projects in full operation as well as certificates of good execution from the respective bodies for which the project was implemented.
- A copy of the EN ISO 9000 Certificate or equivalent, issued by a recognized Institution or Body, established at an EU Member State, or other proof of equivalent quality assurance measures.
- A Solemn Declaration of Law 1599/86, where they state that in the case of award of the Tender's result, they will submit the Insurance Coverage Policy under par. 2.1.3 herein.
- Copies of the Professional Licenses - see par. 2.2. herein - of the Electrical and Electronic Engineers.

ARTICLE 3 - Bid Submission modalities & time

Interested parties can submit their bids, during business days and hours, by Wednesday **30/09/2020** on 15:00 pm, in Greek, not subject to terms, requirements, conditions or provisos.

Address for bid submission:
Thessaloniki Port Authority SA
(Administration Division - Secretariat Department)
Pier 1 (within the Port facilities)

GR 54012 Thessaloniki
After the tender closing date and time, it will no longer be possible to submit bids. Tenders submitted late shall be returned.

ARTICLE 4 – Clarifications on the Call for Tender

Clarification requests are submitted electronically five days at the latest before the expiry of the deadline for submitting bids, as follows:

A) questions on technical issues are submitted to the e-mail address asachinidou@thpa.grwith a copy to the email address: gpapageorgiou@thpa.gr and cathanasiou@thpa.gr.

B) questions on issues pertaining to the tender procedure are submitted to the email address gpapageorgiou@thpa.gr and Cc to cathanasiou@thpa.gr Clarification requests submitted in other forms shall not be reviewed.

The clarifications shall be posted on the THPA SA website www.thpa.gr

ARTICLE 5 – Tender extension, amendment, addition or annulment

ThPA SA holds the right to extend the bid submission date or cancel the award procedure or decide to repeat it at any stage without any liability, cost or penalty, following the decision of its competent body. It also reserves the right to modify the terms of the procedure with transparency.

ARTICLE 6 – Bid content

The contents of the tender folder are defined as follows:

(a) one (sub)folder* marked "Participation Documents - Technical Bid and

(b) one (sub)folder* marked "Financial Bid" and

(C) an electronic storage medium with the content of the two above subfolders in electronic form.

6.a. Participation Documents

To prove that they fulfil the eligibility criteria, the economic operators must submit the following documents:

- A certificate of registration in the relevant chamber (national economic operators) and a corresponding certificate/approval/authorization from the relevant authority of their country of origin (foreign economic operators).
- A company presentation accompanied by the financial statements of the last year (2019).
- A presentation of the structure of the after sales service both in Thessaloniki and the rest of Greece. If a tenderer does not have its own aftersales service department, he will present the structure of the after sales department of the authorized repair shop or the participating repair shop.
- A presentation of the representatives and associates in Greece (it applies only to foreign economic operators).
- A solemn declaration by the economic operators that the grounds for disqualification defined in paragraph 2.1.2 do not apply for them and their legal representatives and that they have no reason to believe that these impairments shall apply during the tender validity period or any of its extensions.
- A Solemn Declaration whereby Candidates declare that they have been apprised on the special terms and requirements of the Tender Object and unreservedly accept the terms of the tender notice. The Declaration will explicitly state that prior to the receipt of the Machine, a Delivery-Reception Protocol will be drafted and will be duly signed both by ThPA SA and the Contractor. In case of different opinion, he must explicitly state the points of divergence.
- To prove their lawful incorporation and representation, in the cases when the economic operator is a legal person, he shall produce the legal establishment and lawful representation documents (such as articles of incorporation, general commercial register certificate, Board of Directors formal establishment etc., in case of societe anonyme etc published in Commercial Registry, depending on the form of the tenderer) The above documents shall specify the lawful establishment, the person(s) legally binding the company on the date of the tender (legal representative, right of signature, etc. in case of societe anonyme etc, published in Commercial

Registry, depending on the form of the tenderer), any third parties authorized to represent the contractor, as well as their term of office.

6.b. <u>Technical Bid</u>

The Technical Bid consists of the following:

- A detailed and clear technical description (in English and in Greek) of the equipment provided. The technical description will consist of a point-for-point reference to the technical characteristics based on the structure of Part B of the tender and keeping the same numbering. The Technical Description must include detailed and clear answers.
- A Table of Technical Features
- The technical description will be accompanied by the necessary plans and diagrams, official documents of technical specifications and any other official technical form documenting the compliance of the machine offered with the technical specifications herein.
- A reference to the country of origin of the equipment.
- A training program
- Any other element that the interested party deems necessary.

6.c <u>Financial Bid</u>

The financial bid shall bear the stamp of the participating economic operator and the signature of its legally authorized representative and will indicate:

The offered price in euro (VAT excluded) of the delivery, fully operational of the Contract's object to ThPA SA

i. The delivery time of the whole project and its single phases. Candidates must take into account that the transtainer's immobilization must not exceed 40 calendar days and that the total delivery time in full operation shall be less than 130 calendar days. Candidates must submit a detailed timetable of the project phases including a detailed planning of the whole project.
ii. The good operation guarantee time which will be valid for two (2) years after the equipment of the equipment and the detection of the failure via remote connection to the PLC-remote access.
iii. The desired payment method, according to Article 13.5 of this Tender Notice.
iv. The bid validity period, in accordance with Article 7 of this Tender Notice.

6.d Pricelist of the proposed spare parts

Tenderers must submit a table of the spare parts, which, at their discretion, are necessary for the normal operation of the transtainer **<u>for two years after the guarantee time.</u>** The table will display the unit prices of the spare parts for their delivery to the Central Warehouse of ThPA SA and their delivery period, which should not exceed 14 calendar days. ThPA SA will choose to purchase the spare parts, which, at his sole discretion, are necessary, in bigger or smaller quantities than the suggested ones.

ARTICLE 7 – Bid Validity Period

The submitted bids must be valid for **one hundred eighty (180) days** from the Tender bid closing date.

The bid validity may be extended, if requested by ThPA SA, prior to its expiry, for a maximum period of time equal to the initial bid validity period specified in the Call.

ARTICLE 8 – Price Adjustment

The offered prices are considered **<u>fixed and final</u>** and are not subject to adjustment for any reason and cause until the end of the procurement. For this reason, by signing this contract the Contractor explicitly, unreservedly and irrevocably waives all its rights with regard to any adjustment of the offered prices that might arise from other relevant provisions.

ARTICLE 9- Counteroffers

Alternative bids, counteroffers or amended offers or any proposals that may be construed as counteroffers shall not be considered and shall be rejected by the THPA SA competent body, following the recommendation of the Tender Committee.

ARTICLE 10 - Language

The official language of this procedure is Greek and English. All details of the bids shall be either in Greek or English (if they are drafted in the language of their country of origin) and accompanied by an official translation into one of the above languages. Where there is a discrepancy, the prevailing wording is one of the official languages of the tender.

ARTICLE 11– Bid Evaluation

During the evaluation, THPA SA may address requests to the participating economic operators to provide clarifications and the economic operators must provide the clarifications within the specified deadlines, as the case may be.

Once the evaluation has been completed, the tenderers shall be notified on whether their tender has been accepted or rejected.

The award criterion for the contract is the lowest price since all technical specifications, as described in detail in Part B herein, are met

ARTICLE 12 – Contract

After the announcement of the tender result, a contract is signed between ThPA SA and the selected economic operator.

The contract may be amended during its term of validity, without the need for a new contract, following an agreement between the two parties.

ARTICLE 13 – Special Terms of the Procurement

13.1 Performance bond

To sign the contract, the Contractor must submit a Performance Bond, the amount of which is defined as 5% on the contract value, not including VAT, delivered before or upon contract signing, valid until the entry into force of the performance warranty bond.

The Guarantee is issued by Greek credit institutions and covers the implementation of all contractual terms and requirements of THPA SA against the supplier, in their entirety and without discriminations.

The performance bond shall be forfeited in the case where the terms of the contract are violated, as specifically defined.

13.2. Delivery time

The total delivery time is set by the tenderers in their bid and cannot exceed 130 calendar days from the signing of the contract and the 40 calendar days of immobilization for the transtainer.

In case of late delivery, a 1% penalty on the contractual price shall apply for each day of delay, up to a maximum of 5%.

13.3. Delivery - Controls

The equipment delivery fully operational.

Upon delivery, the following controls will be performed:

- General Inspection and verification of the compliance of the machine manufacture with the technical specifications of the Tender notice.
- Control of the machine operation with a rated load.
- Speed measurement - lifting travel lowering the machine loaded/unloaded, fully loaded creeping according to its technical characteristics.
- Control of limit switches and safety systems.
- Brake control and settings.

Project execution timetable

Within five (5) days from the signing of the Contract, the Contractor shall submit to ThPA SA a complete timetable of all Project execution phases, which will be in accordance with the one submitted in his bid

13.4 Reception procedure:

After the installation of the new plc system,

all the systems and the delivery in full operation of the transtainer, the Contractor shall undertake at his expense and in cooperation with a Control Body approved by the Ministry of Development to perform an AA Type control for the re-issuance of a new Certificate - Re-control (the necessary weights for the audit will be provided by ThPA). Following the issuance of the above Certificate, the transtainer will be put into service for 50 hours. During this period, it must be verified that it operates smoothly and the Contractor must have the possibility to make any necessary final adjustments. If during the last 20 hours of operation, no dysfunction is detected to the transtainer due to the Contractor (materials - labour), the Acceptance Committee will draft and sign the relevant Acceptance Protocol.

The good time guarantee time shall commence on the date of signing the Acceptance Protocol.

13.4 Equipment Performance Warranty

13.4.1 Performance warranty period

The minimum acceptable good performance warranty period is two years commencing on the date of signing of the reception protocol. During the warranty period, the supplier shall restore any damage or fault resulting from poor workmanship or defective materials. More specifically, the supplier shall respond within 48 hours by deploying a specialized technical crew. If the supplier fails to restore the damage or fault within the guarantee time, ThPA SA reserves the right to restore it by its own actions, ascribing the cost to the supplier.

If the machine is out of order for more than five days, the total guarantee time will be extended accordingly.

The time period between the failure event notification to the supplier and the delivery of the machine by the supplier in full operating condition will be the period out of service. If the machine remains immobilized due to a damage of the spare parts of the new PLC controller, the new spare parts will be necessarily accompanied by a guarantee with the same duration as the initial one.

13.4.2 Performance warranty bond

A Performance warranty bond, the amount of which is defined as five per cent (5%) on the contract value, not including VAT, expiring sixteen (60) days after the end of the performance warranty period, is delivered after the reception of the equipment.

In the case where the supplier fails to comply with his contractual obligations, ThPA's competent body shall decide the forfeiture of the Performance Warranty Bond, in all or in part.

13.5. Pay - Suggested payment method

The procurement is financed from the regular budget of ThPA SA

An amount up to twenty-five per cent (25%) of the total contract value, VAT not included, may be provided as an advance payment upon signing of the contract and against an Advance Payment Bond.

After the reception of the equipment and the successful completion of controls and training, ninety-five (95%) of the total value (after deducting the advance payment) is paid to the supplier and the advance payment bond will be returned. The payment will be made within sixty (60) days form the issuance of the invoice subject to the presentation of an insurance clearance certificate.

The remaining five per cent (5%) is paid after the issue of the registration and the signing of the Acceptance Protocol.

13.6 Training – Operation monitoring

Immediately after the delivery of the transtainer in full operation, the Contractor shall make available the necessary personnel for monitoring the initial stage of the machine operation and restore any damages. The Contractor shall make available the necessary Personnel for training at least (8) technicians of the client on such subjects as the machine control, adjustments, repairs and functions. The training of the technicians shall cover all single systems of the machine (mechanical, electrical, hydraulic) and will take place in a classroom but also on the machine. Moreover, the Contractor shall train at least five (5) operators on the machine operation and simple maintenance.

Training will be held in Greek. If interpretation is required, the cost will be covered by the Contractor.

Upon completion of the above stage (monitoring the machine operation - training of ThPA SA personnel), the Contractor will grant to the trained a training certificate.

13.7 Contractor's other obligations

- The Contractor's employees will work in these premises under the supervision and the instructions of the Contractor's competent bodies.
- It is explicitly clarified that this personnel does not have a dependent employment relationship with THPA SA
- The Contractor shall bear full and exclusive responsibility for any damage or failure that may be caused to a person or object of ThPA SA, the personnel he employees or any third party, due to this project or in connection with the Contractor's or Contractor's crew actions.
- The contractor is obliged to perform himself the above-described project in full and for the entire duration specified by the Contract, without the right to assign or in any way substitute it in whole or in part.
- The Contractor shall take all appropriate measures to ensure safe execution of works and shall bear sole and exclusive responsibility for staff insurance and full and exclusive civil

and criminal liability for any occupational accident or possible damage which may occur at the workplace to persons or things belonging to him, the ThPA SA or any third parties.

- The Contractor must be aware of the Workers' Health and Safety Regulation (decision number 2643/27.06.2005) of ThPA SA. SA
- The Contractor shall insure its personnel at its own cost against any type of accident.

PART B - TECHNICAL TERMS AND SPECIFICATIONS

1. The transtainer's immobilization shall not exceed 40 days.

2. The transtainer's delivery alongside the new systems in full operation shall not exceed 130 days.

1. Quality - Regulations

The equipment offered shall be new, of best quality, of a standardized current production line.
The procurement will be held based on this Technical Specification, the manufacturing drawings of the Transtainer and the applicable regulations EN, IEC, DIN/VDE, ANSI/IEEE, or other equivalent regulations, approved by ThPA SA.
Tenderers must have performed a similar project on an electric crane, transtainer or gantry crane or on a winch with an equipment of the same type as the one they provide.

2. General remarks about the electrical equipment and the electrical installation

All the components of the electrical equipment, unless otherwise stipulated in some paragraphs, shall be compliant with the applicable regulations FEM, BS, VDE, IEC, DIN or equivalent ones. All the components will be new, of modern technology and manufactured by recognized manufacturers. For the installation of the electrical equipment, the applicable FEM regulations will apply, and if a relevant provision is missing, other applicable regulations will apply.

The codification of electrical drawing and equipment will be done against DIN 40719 or more recent. Every component of the electrical equipment (including the electronic equipment) (motors, cables, limit switches, electronic boards etc.) will have a code. This code will be written in indelible letters on a plastic label placed on the component. The same code will distinguish every component on the plans that will be delivered. The plan layout will allow anyone who reads the code on the component's label to identify it on the plan and vice versa, i.e. if someone reads the component's code on the plan, he will easily identify its place on the transtainer.

3. Scope of the Procurement

3.1. Procurement, dismantling of the old ones and installation in full operation of a the transtainer PLC control system.

1. Dismantling of the existing PLC electronic systems and delivery to the spare part warehouse of ThPA SA.

2. The procurement and installation - until full operation of a PLC control system on the transtainer installed at ThPA SA Container Terminal.

3. Procurement, installation of a remote I/O units for the interconnection and the transmission of signals of all movements of the transtainer with a programmed PLC and safety plc.

4. Procurement, dismantling and installation of Low Voltage General Table and replacement with a new one: (See electronic schematics M1E1)

5. Procurement, installation of 4 new weight sensors with analogue output (ISETRON, PAT-KRUGER, BROSA).

6. Procurement of five pulse generators, dismantling of the old ones and installation of the appropriate electronic pulse generators (pulse encoder) to control all drives.

7. Procurement of two absolute encoders with overspeed detection to measure the absolute position of the spreader & trolley respectively:

8. For the trolley drive and lifting, the possibility of using the existing limit switches to slow down or stop drive. In any other case (of breakdown or failure), the Contractor shall provide this material.

9. Procurement and installation of trolley drive, lifting and rotation controllers of a recognized manufacturer.

10. Procurement, installation and connection of special optical cables (at least 6 pairs) 120m long approximately, for the connection and transmission of signals with the new remote I/O unit of all transtainer drives with the PLC controller. One pair will be used to create a separate local network for connecting computational systems of ThPA SA.

11. Connection and operation of the existing security systems with the PLC controller (safety PLC).

12. Procurement and installation of transtainer CMS in the power room, in the operator cabin and remotely at the management office.

13. Procurement and installation of a wind speed monitoring system.

14. Performance guarantee which will be valid for (2) two years from the reception of the equipment fully operational and the detection of the failure via remote connection to the PLC-remote access.

15. Training of ThPA technical personnel on PLC systems.

3.2. <u>Replacement of all existing drive systems of the transtainer of ThPA SA with new ones</u>

1. Removal of all existing motors speed controls and delivery to ThPA SA

2. Procurement, transfer, delivery and installation to ThPA SA of new:

Electronic control units to control the main motors

- Lifting drive
- Rotational drive
- Trolley drive
- Travel drive 1
- Travel drive 2

and other power cables and signals for connecting auxiliary consumptions and control signals.

4. Trials, adjustments and commissioning of the entire equipment provided will be performed by the Contractor's competent technician, who **<u>is specialized and has a proven experience in the installation and configuration</u>** of similar drive systems with frequency converters on electronic cranes, transtainers or G/C or on winch applications, in cooperation with ThPA employees.

5. Training of the technical personnel of ThPA on the new drives (electricians) and the new mechanical systems (engineers) following agreement with the competent Division of ThPA SA.

6. After the commissioning of the entire equipment, the Contractor shall deliver duplicates of the following:

- A full set of the final designs of the equipment (as manufactured), in printed and electronic form (EPLAN).
- A full set with equipment installation, operation, regulation and maintenance.
- A list of materials and recommended spare parts in printed and electronic form.
- The full software for programming, configuration and control of the frequency converters and DC drives through the PC, as well as files with the final adjustments.

- To make available the necessary personnel in order to remedy problems that may occur during the operation of the transtainer due to the functioning of the new systems.

NOTE: It is clarified that "Procurement" shall be understood as the total number of works, materials, machinery and services required for delivering the transtainer in full and normal operation.

(C) Crane overload protection systems

The new system consists of 4 sensors 9 (weight measurement pins) of a 24Vdc output voltage and a 0-20mA output.
They will cooperate directly with the PLC and will be configurated through the appropriate CMS screen. There will also be a provision for bypassing the system in case of emergency, using a password.
In case of an overload, the lifting drive (aweigh) will be suspended.
Only the lowering drive until the deposit of the overload on a safe place will be allowed.

3.3. Lifting, rotation, trolley and drive motion controllers

The controllers will be of the latest generation of a recognized and well-known manufacturer, suitable for use on electric cranes and gantry cranes with wide distribution in the EU.
Technical Features:
- with return springs
- high resistance
- direction contact and dead centre contacts
- mechanical life span 10.000.000 operations
- operation temperature –25…+60oC
- connection to automation through PROFINET or Modbus TCP.

3.4. Pulse generators (pulse/absolute/incremental encoder)

Dismantling of the old, procurement and installation of new electronic pulse generators of a recognized manufacturer (e.g. Hubner) (pulse encoder/absolute) with the necessary number of pulses per rotation 1024 minimum, which will work with the speed control to confirm speed. The encoders can be used for a relatively accurate determination of position.
In the case of the 'lifting & trolley' drive, an absolute encoder must be installed with the appropriate Overspeed switch & Limit switch accurate determination of position. (the procurement shall include the copper cables and optic fibre, patch-panels, patch-cords for the installation in full operation)
To avoid noise problems in the signal transmission, the encoders connection must be done with optic fibres. The description of the solution and the additional cost must be indicated separately on the bid.

3.5. Procurement, dismantling of the (M1E1) and installation of a Low Voltage Main Switchboard:

The switchboard that will be replaced includes all the necessary equipment in fuses and switches

3.5.1. General

Low Voltage Electrical Switchboard with independent front-access doors IP65, form 2b,with type and series test certificates per EN61439-1-2 / IEC 61439-1-2 (i.e. system pro E power ABB, Schneider)(~ 1500mmx1200mm)

3.5.2. Installation of electrical -switching equipment – devices

The installation of the devices must be done in a way as to drop rising temperature on the low voltage switchboard and opt for connections facilitating heat dissipation in order to meet the increased temperature requirements, in conformity with the IEC61439-1 standard. The safety distances both between the devices and between the device and the metal part of the board must be in conformity with the requirements of their manufacturer.
The devices will be placed on supports that can bear their weight, without deformation, and resist the vibrations created during the use of the transtainer.

For the placement of the rail elements, aluminium double profile rails must be used; at the back side of these rails, it will be possible to mount cable routing canals made of self-extinguishing plastic using special spare parts. For the safety of the low voltage switchboard user, no partitions will be required, as set out in the IEC61439-1 standard.

Cable wiring

If the wiring is dense, 100x100 mm self-extinguishing plastic cabling channels must be used for a vertical placement and 60x80 mm ones for a horizontal placement using special spare parts.

The ration of the cable cross-section to the free space of the canal should not exceed 50%. All the cable will be terminated in terminals pressed using a special tool. The cable terminals must be of a suitable type and size for the cables that will be used and will bear thermal contraction rings.

The naked part of the cable lug and the terminals will have an insulation 'sleeve' of a distinctive colour depending on the cross-section of the cable, where used.

Any splice of the auxiliary cables in any way is not allowed. The use of insulating tapes is not allowed. The cables of the auxiliary circuits will be tied and set in strands with tying-up plastics, spirals, pipes or plastic loops if of low density.

Special care will be given for the protection and the support of auxiliary cables from devices placed on moving frames of electric switchboard (e.g. Opening fronts). Their attachment must be done with special pipes, offering sufficient comfort during movement.

The auxiliary wiring will be done using flexible cables with a cross-section of 1,5 mm2 for general use and for the measurements (/5A) with a cross-section of 2,5 mm2. The use of single-strand pipes and the use of pipes with a cross-section smaller than 1,5 mm2 is prohibited. All auxiliary circuits must end in strip connectors.

Type and Series Trial Certificates

1. The L.V. Switchboard must be manufactured by a recognized manufacturer with a proven experience in the manufacture of certified L.V. Switchboards in similar projects and fulfil the requirements of the following type trials, according to the standard IEC61439-1:

1. Temperature Rise Test (par. 8.2.1 of the standard)
2. Dielectric properties test (par. 8.2.2 of the standard)
3. Short-circuit withstand strength test (par. 8.2.3 of the standard)
4. Protection system reliability trial (par. 8.2.4 of the standard)
5. Creepage distances 8.2.5 of the standard)
6. Mechanical function test (par. 8.2.6 of the standard)
7. Protection degree test (par. 8.2.7 of the standard).

The respective Type Trial Certificates by recognized European labs must be available and attached to the bid.

3.5.3. Quality assurance

The board will bear CE marking in accordance with the New Approach European Directives 73/23/EEC and 93/68EEC respectively.

It must be accompanied by complete multi-line drawing of the electrical circuits, complete dimensioned construction plans (front view, ground view etc) and the list of spare parts and the manufacturers of the various devices of the board by a recognized, design-computational, electrical engineering system.

3.6. Project execution timetable

Within five (5) days from the signing of the Contract, the Contractor shall submit to ThPA SA a complete timetable of all Project execution phases which shall be in accordance with the one submitted in his bid.

The timetable must take into account that the transtainer's immobilization days should not exceed 40 days.

3.7. Spare parts

In the folder of their FINANCIAL BID AND REGARDLESS OF THEIR MAIN BID, tenderers must also include a table of the spare parts, which, at their discretion, are necessary for the normal operation of the transtainer for two years after the guarantee time. The table will display the unit prices of the spare parts for their delivery to ThPA SA and a delivery time of no longer than 14 calendar days. ThPA SA will choose to purchase the spare parts, which, at his sole discretion, are necessary, in bigger or smaller quantities than the suggested ones.

3.8. Operation & maintenance instruction Plans & Manuals

Before signing the Reception Protocol, the Contractor will submit to the Service three (3) original manuals of the approved operation and maintenance instructions of the equipment in hardcopy and in

electronic form. The manuals will be tied with each other and on the title of each equipment will be displayed on the front cover. The manuals will included general drawings, wiring and circuit diagrams, technical operation details, settings and maintenance of the equipment and the control systems etc. of the equipment and not just the changes. Every manual shall include a detailed full catalogue of spare parts, and all the names of the manufacturers and their addresses. The manuals must be divided into sections that are appropriately signed and indicate the content of each section.

3.9. Operation & maintenance instruction Plans & Manuals

The Contractor will submit the following:

3.9.1. Construction plans before the start of the works - the time limit thereof must be indicated on the submitted timetable.

3.9.2. Carbon final drawings after the completion of the works (as built) (Wiring diagrams of the transtainer in printed and editable electronic form (**Eplan**). The plans that will be submitted must include all electronic/electric circuits.

4. Procurement, dismantling of the old ones and installation in full operation of a the transtainer PLC control system

All the old systems-spare parts will be delivered via a Delivery-Reception Protocol to ThPA SA by the Contractor to the Competent Committee and, more specifically, they will be stored to the Central Warehouse.

4.1. Programmable Logic Controller- PLC

4.1.1. General

The full control of the transtainer operation (drive control, engine operation control, electrical locking mechanisms, brake operation, signals from limit switches etc.) will be conducted by a PLC of the latest generation by the manufacturer for use on G/C.

4.1.2. Main features

- The system will include the necessary input-output cards, digital and analogue, and all peripherals that are necessary for the safe and reliable operation of the transtainer control system. For example, the uninterrupted power supply, watch-dog, safety relays etc.

- The PLC architecture will consist of the necessary inputs-outputs, keeping 10% of the available resources (remote I/O unit) for the transfer of control signs from remote areas i.e. operator's cabin and elsewhere.
- The bid must describe the precise number of inputs-outputs provided.
- The new PLC must work perfectly with the existing electronic systems. The communication protocol with the speed controls will be PROFINET or Modbus.
- The PLC can communicate with the dc drive and the CMS for a two-way transmission of parameters, data and/or errors.
- For the system protection, the procurement of all the cards making up the PLC including the supervision and the remote i/o systems shall be provided by one or more online UPS.

4.1.3. PLC Software

The PLC software will be standardized and will originate **from ready libraries,** which will be configured appropriately in order to be installed to the transtainer. The main functions that must be included in the software (ready-to-run) Hoist control, Trolley Control, Gantry control, and swing control. (The bid must also include the brochures of the manufacturing company. The software of the existing PLC AEG A500 can be updated (migration) to the new one.
The programme of the 'central' PLC will also include the software in the transtainer to control overload protection.
The programming software of the PLC will be compatible with the latest version of the Windows operational system and the PLC will be programmed via a connection of a portable computer or the computer of the transtainer monitoring system, with a user-friendly language/programming method.

4.1.4. Remote Units

The I/O modules will have tell-lights to indicate the status of each input/output. The system will be installed on a special board in the power room or the operator's cabin.

4.1.5. Interconnection with Remote Units

The PLC connection with the Remote I/O Units will be performed using a fibre optic of minimum (6) pairs, suitable for routing and operation in FESTOON, terminated in the appropriate patch panels, which will pass through the existing FESTOON system and the appropriate routing up to the power room. The communication protocol will be PROFINET or Modbus TCP.
The fibre optic cable that will be installed must have the necessary mechanical strength (2000N) and the necessary rubber cover, resilient to environmental effects (temperature variations, humidity etc) and also to oils and fire. (IEC 60332-1-2 EN 60811-2-1)

4.2. Transtainer Monitoring System

The required transtainer monitoring system must be especially designed for industrial applications/transtainer/cranes/gantry cranes and must have a **demonstrated installation** in applications of monitoring and controlling industries/gantry cranes/sinking bridges.

The most important goal of the monitoring/supervision software is to improve the effectiveness of the interventions by the maintenance personnel providing information in an operational way and setting the requirements for an easier troubleshooting. The CMS must be based on a Windows software, which is suitable to monitor and control gantry cranes.
Its structure will be modular and extendable and must be fully compatible with the PLC architecture. The actual capacity of the transtainer should not be transformed after the installation of the CMS and in the event of a failure of the diagnostic system, the normal operation of the transtainer will not be affected.
The **monitoring/supervision equipment** will be of industrial type without a fan and solid state discs. The absence of moving mechanical parts reduces the possibility of a damage. The screen (flat LCD or LED) must have a sufficient degree of protection and it must have a UPS to minimize the possibility of a system failure.

The main operational features of the CMS will be:

1. Menu for the different available options
2. Possibility to adjust screens and choose language
3. Possibility of ease modification and extend the Help menu
4. Representation of situations and measurements in real time and in graphs
5. Representation and storage of operation data
6. Representation and storage of operation data
7. Storage of failures, warnings, locking mechanisms and user incidents with the possibility to develop reports and printing
8. Error diagnosis and detection guide
9. Connection with the local network (LAN) and the existing wireless network

At the CMS there will be access from at least two ports

1. At the transtainer electrostatic (main installation)
2. At the operator's cabin (brief representation of its operation and state) (Touch operation 9" widescreen, TFT display, 16 million colours PROFINET/Modbus interface)
3. At a remote spot at the Container Terminal Equipment Allocation Department or another spot (e.g. Computer room) using the existing wireless network.

The CMS computer in the power room of the industrial type transtainer will have the possibility, through the appropriate software, to connect directly to the PLC and monitor and/or develop/amend its programme using authorized passwords.
Also, for the new digital converters that will be installed, the on-line connection for monitoring and adjusting their parameters through the appropriate software.
The use of the system must not require from the final user to have specialized knowledge in computers or programming languages.
Irregularities (errors and warnings) will include a short description and the date/time of the error and the alarm reset.

Also, for each active error, there will be a link with a text and display of the respective electrical drawings (on-line help), which will give all the information about the necessary trials and controls in order to detect the origin of the failure and facilitate the elimination of errors/failures. The text must be written in a way that it can be modified by the maintenance personnel in the future.
In their technical bid, tenderers must make explicit reference to the fault indication system in the cabin, the power room and the remote central checkpoint at the Container Terminal.

5. AUXILIARY EQUIPMENT - WARNING AND SECURITY SYSTEMS

5.1. Anemometer

An anemometer **without moving parts** (ultrasonic) will be placed at the highest level of the transtainer. The measurements made by the anemometer will be displayed on an instrument in the operation cabin and it would be useful to ensure remote access to its indications.
When the wind speed exceeds 25 m/sec (configured), every motion of the transtainers will be interrupted and the pincers type devices that will immobilize the transtainer. Prior to the interruption of the motion, the operator will receive a sound and visual warning (when the speed exceeds 22 m/sec approximately).
The system will be activated after a continuous breath of wind (of the above speeds) and for an (adjustable) time period. Thus, its activation due to sudden strong gusts of wind.

5.2. Electricians training on PLC operation

A complete 5-day theory and practical training/education will be offered to a group of technicians upon request by ThPA SA at the premises of the PLC electronic system manufacturers **before** sending the equipment. All expenses for this training/education (including air tickets, accommodation and food expenses etc.) will be undertaken by the successful Contractor.

The training must be offered in Greek and cover basically the following:

- Familiarity with the equipment
- Explanation of electrical drawings (each one separately).
- Operation principles of the PLC installed on the transtainer - Programming Language - Explanation of the specific application
- Component arrangements or replacements that need to be done on replacement electronic cards, if any of them needs to be replaced
- Possible damages - causes
- Damage detection method
- Virtual damage on G/C - detection - repair
- Regulation -maintenance of electrical equipment.

Maintenance instructions, including:
(A) Daily, weekly, monthly and semestrial inspection
(B) System adjustment
(C) Damage detection and repair

A second round of training will be offered to a group of 8 electricians in two rounds of five calendar days each and five (5) at least operators. This training will be held in a room of ThPA SA and on the transtainer for the professional training of all technicians/ technical staff after the delivery of the equipment. All training notes will be delivered for use by ThPA SA after the completion of training in printed and electronic form. The training will begin after the signing of the Acceptance protocol.

NOTE:

Tenderers can visit the transtainer of ThPA SA in order to be informed on the spot and learn more about the works required and the size of the equipment. The on-the-spot visit will be held on a day and time that will be agreed upon.

6. Electronic speed controls (DC Drives)

Below, find the technical features of the motors, which will be
driven by the ESC per drive.
Each drive will be standardized and in a production line of the company manufacturing it. It will also have the following features:

6.1. Main features

In terms of features and efficiency, the must cover at least
The existing ESC (power, rated current etc.)

4 quadrant operation with return of energy to the network during
regeneration. The start of the ESC after an error will be possible only after identification of the error (reset) and after the 'on' command is given again, thus protecting the system from an undesirable start. The speed controls will have the necessary electronic input/output for control and connection with the existing automation/PLC,

Supply voltage: 400V 3ph ac (+15% /-20%)
Stimulation Supply voltage: 400V 3ph ac (+15% /-20%)

Rotor Rated voltage 420V dc
Electronic Supply voltage: 380(-25%) - 480V(+10%) 2ph ac or
190(-25%) - 240V (+10%) 1ph ac
Frequency 45–65 Hz
Operation temperature:-0-45DegC
Closed loop control: 0.01% with pulse generator
Rated power (continuous operation) Sizing based on the existing motors and the required performance.
Efficiency >= 97,0%
Type of mains IT (mains without earthing of the neutral point)

The main elements of the dc drives include the following:
- DC drive unit
- Stimulus unit (that may be integrated into drive)
- Line reactor (choke)
- Switch and input contactor (ac supply)
- Output contactor (dc contactor), if needed

Each dc drive must have minimum the following characteristics:
- Digital speed and torque regulation
- Input for connecting a pulser/a tachometer generator
- Communication unit with the PLC (preferably using fibre optic fibres),
- Removable local controller with:
- LCD indication screen and display of the reference value and at least three different actual values
- Possibility of copying parameters from one transformer to another one of the same type.
- Possibility of local control through the options:
- LOCAL/REMOTE, START/STOP, RESET, MOTOR ROTATION DIRECTION, insert REFERENCE
- In-built error memory with the possibility of storing at least 6 errors, even after a total black out.
- Overvoltage and under-voltage protection
- Overcurrent protection
- Overheating protection

6.2. Environment conditions

The CD drives will be closed type, with a protection degree equal or higher than IP21 and must be suitable for operation in a highly humid environment. It shall be installed at an attitude lower than 1000m from sea level and environment temperature from 0oC to 40oC.

6.3. Compliance with the standards

In their bids, tenderers must include a certificate from the manufacturing company of the DC drives certifying that "The DC Drive is manufactured according to the following standards or equivalent:" EN50178 , EN50081 and EN50082 and partly EN60204-1 .

MANAGING DIRECTOR-CHIEF EXECUTIVE OFFICER

FRANCO NICOLA CUPOLO

ANNEX

MAIN SIZES - OPERATIONAL FEATURES

NOTE
Tenderers can visit the transtainer of ThPA SA in order to be informed on the spot and learn more about the works required and the size of the equipment. The on-the-spot visit will be held on a day and time that will be agreed upon. The folllowing functions are indicative. All existing functions must be covered by the installation of a new PLC.

ELECTRICAL EQUIPMENT

General data
- Supply voltage 20KV
- Current frequency: 50 Hz
- Main drive motor voltage: 500 V
- Auxiliary system (fans, brakes etc) motor voltage: AC 380 V.
- Lighting and heating voltage: AC 220 V

Environment conditions
- Environment temperature (operation conditions): -10 to 45 oC

RUNNING SPEED:

1.	Lifting-lowering with the safe working load (SWL) under the SPREADER:	60m/min
2.	Lifting - lowering with the SPREADER Without load:	120 m/min
3.	*Trolley travel with the safe working load (SWL)*	180 m/min
4.	*Transtainer travel with the safe working load (SWL)*	45 m/min

Speed variation in all drives from 0-100% is unrated.
During lifting-lowering, the maximum speed depends on the suspended load (changes in inverse proportion to the load).

ACCELERATIONS

1.	Lifting - lowering with safe working load:	0,550 m/sec2
2.	Trolley travel with safe working load:	0,625 m/sec2
3.	Transtainer travel with safe working load:	0,150 m/sec2

10 - DRIVE - DRIVE TRAINS

The transtainer performs the following drives:

1. **Hoisting: lifting - lowering)**

2. **Gantry travel**

3. <u>Trolley travel</u>

4. <u>Rotation</u>

CONTROL BOARD INDICATIONS IN THE OPERATION CABIN:
In the operation cabin, the crane operation, height, error etc. indications are displayed on a metal board which consists of analogue instruments and light indicators.

<u>Limit switches and safety systems</u>
See wiring diagram

EXISTING EQUIPMENT

1. Programmable Logic Controller AEG A500.

2. Electronic speed controls to control the main motors,
of type AEG Minisemi D.

a. Lifting drive: Minisemi D 380/760+GO, 760A dc, ED-100%, 0..45oC
b. Rotational drive: Minisemi D 380/60+GO, 60A dc, ED-100%, 0..45oC
c. Trolley drive: Minisemi D 380/420+GO, 420A dc, ED-100%, 0..45oC
d. Travel drive 1: Minisemi D 380/875+GO, 875A dc, ED-100%, 0..45oC
e. Travel drive 2: Minisemi D 380/875+GO, 875A dc, ED-100%, 0..45oC

Motors

LIFTING DRIVE
Rated power : 190KW, S3 - 60%
Rated voltage : 400 Vdc
Rated current : 562 A
Max current : 760A
Rated speed : 900 rpm / 1920 rpm

ROTATION DRIVE
Rated power : 12.2 KW, S3 - 60%
Rated voltage : 400 Vdc
Rated current : 36.2 A
Max current : 50.7A
Rated speed : 1330 rpm

TROLLEY DRIVE (4 motors)
Rated power : 4x14 KW, S3-60%
Rated voltage : 360 Vdc
Rated current : 4x42,5 A
Max current : 4x93,5A
Rated speed : 1500 rpm

TRAVEL DRIVE 1 (5 motors)
Rated power : 5x20 KW, S3-60%
Rated voltage : 370 Vdc
Rated current : 5x59,6 A
Max current : 5x175A
Rated speed : 2400 rpm

TRAVEL DRIVE 2 (5 motors)
Rated power : 5x20 KW, S3-60%
Rated voltage : 370 Vdc
Rated current : 5x59,6 A
Max current : 5x175A
Rated speed : 2400 rpm

Analogue controllers to control drives
The controllers can adjust the drive speed with an analogue signal of +-10Volt. Preferred manufacturer is Spohn and Burkhardt.

Analogue overload protection system
The old system consists of sensors (pins with an 0-10mV output), and analogue cards (amplifiers) adjustable with potentiometers.

Error Diagnostic System
The existing diagnostic system describes the error on a monitor screen, located in the power room. It refers to the corresponding number of the wiring diagram and the corresponding input on the plc.

Available files in electronic form (after request):
1. Transtainer wiring diagrams
2. Photos of pulse generator components
3. Photos from motor components
4. Photos of the existing drive components