

OIL EXPORT PUMPS SKID - CONPET / SKID DE POMPARE TITEI - CONPET

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1. GENERALS / INTRODUCERE

1.1 PROJECT SCOPE / DESCRIEREA PROIECTULUI

New Tank Farm Park 3 Oarja Project, covers installation of a new Tank Farm and Oil Processing Facility, solving the area integrity issues of existing facility Park 3 Oarja, and undertaking services of TF Cateasca which will be further decommissioned (not in scope). By project implementation, the operational safety will be improved, complying with the OMV standards, the emissions of hydrocarbon gases to atmosphere (zero routine flaring policy) and carbon emissions shall be reduced as well.

The design of the new installation will be done to ensure safety and efficiency in operation, personnel and equipment protection and environmental pollution prevention.

Noul proiect Depozit Parc 3 Oarja acopera instalarea unui nou depozit si a unei noi instalatii de prelucrare a titeiului, solutionarea problemelor de integritate in zona cat si ale instalatiei existente in Park 3 Oarja si serviciile oferite de TF Cateasca care vor fi desfiintat (nu e scopul acestui proiect). Prin implementarea proiectului, siguranta operationala va fi imbunatatita, cu respectarea standardelor OMV, emisiile de gaze de hidrocarburi in atmosfera (politica de ardere de rutina zero) si emisiile de carbon vor fi, de asemenea, reduse.

Proiectarea noii instalatii va fi facuta pentru a asigura siguranta si eficienta in operare, protectia personalului si a echipamentelor si prevenirea poluarii mediului inconjurator.

1.2 DOCUMENT SCOPE / SCOPUL DOCUMENTULUI

The scope of this document is to describe the minimum requirements for the design, fabrication, inspection, assembly and delivery of the Oil Export Pumps Skid, related to oil processing unit under this project.

Scopul acestui document este acela de a descrie un minimum de cerinte generale pentru proiectarea, fabricarea, testarea, ambalarea si transportul unui Skid de Pompate titei curat, aferent grupului de procesare titei din cadrul proiectului actual.

2. DEFINITIONS AND ABBREVIATIONS / DEFINITII SI ABREVIERI

2.1 DEFINITIONS / DEFINITII

The following definitions will be used in this document without the need of any further explanation:

Technical Specification – document containing specific instructions and data base for product assembly or system.

Vendor/Supplier – Means the manufacturer and/or supplier of a commodity, system or piece of equipment to perform the specified duty.

Company – Means CONPET SA

Operator – Means a person employed on the facilities to perform the duties required to operate the facility.

In cadrul documentului se vor utiliza urmatoarele definitii fara sa fie necesare alte explicatii:

Specificatie tehnica – document care contine instructiuni specifice si date de baza pentru un produs, ansamblu sau sistem.

Vanzator/Furnizor – inseamna fabricant si/ sau furnizor pentru fabricarea si/sau livrarea echipamentelor si bunurilor in cadrul proiectului

Company – Inseamna CONPET SA

Operator – Inseamna persoana angajata in instalatie pentru a indeplini sarcinile necesare pentru exploatarea facilitatii.

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SHALL is used to indicate that the subject is mandatory.

SHOULD is used to indicate that the subject is not mandatory but is recommended as a good practice.

WILL is used normally in conjunction with an action by Client.

MAY is used to indicate that the subject is optional.

TREBUIE este utilizat pentru a indica o obligatie.

AR TREBUI este utilizat pentru a indica ca subiectul nu este obligatoriu, dar este recomandat pentru o folosinta uzuala.

VA FI este folosit normal in paralel cu actiunile Clientului.

AR PUTEA este utilizat optional pentru subiect.

2.2 ABBREVIATIONS / ABREVIERI

- | | |
|--|--|
| <ul style="list-style-type: none"> - SPC - Technical Specification, - PFD - Process Flow Diagram, - P&ID - Piping and Instrument Diagram, - Prime Mover - A device which provides rotating power to a pump - NPSH - Net Positive Suction Head - NPSHA - NPSH Available - NPSHR - NPSH Required - OMS – Oil Metering Skid - TP - Tie Point - ITP - Inspection and Test Plan, - PED - Pressure Equipment Directive, | <ul style="list-style-type: none"> - SPC - Specificatie tehnica, - PFD - Schema Flux Tehnologic, - P&ID - Schema de Conducte si Automatizari, - Motor de antrenare - Un dispozitiv care asigura puterea de rotatie pentru o pompa - NPSH – Inaltimea de Aspiratie Neta Pozitiva - NPSHA - NPSH Disponibil - NPSHR - NPSH Cerut - OMS –Skid masura titei - TP - Punct de racord - ITP – Plan de Inspectie si Testare, - PED – Directiva Echipamentelor sub Presiune, |
|--|--|

3. REFERENCES DOCUMENTS / DOCUMENTE DE REFERINTA

3.1 CODES AND APPLICABLE STANDARDS / CODURI SI STANDARDE APLICABILE

The materials and equipment described in this specification must be according to the latest edition of standards and normatives.

The design, fabrication, execution, tests and commissioning of the Oil Export Pumps Skid will comply with the following requirements:

EN ISO 14847:2002 Rotary positive displacement pumps. Technical requirements

EN ISO 5199:2002 Technical specifications for centrifugal pumps. Class II

Materialele si echipamentele prezentate in aceasta specificatie tehnica trebuie sa fie in concordanta cu ultima editie a standardelor si normativelor.

Proiectarea, fabricarea, executia, testele si punerea in functiune a Skidului de Pompare Titei se vor realiza conform cerintelor:

EN ISO 14847:2002 Pompe volumice rotative. Condiții tehnice

EN ISO 5199:2002 Condiții tehnice pentru pompe centrifuge. Clasa II

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SR EN 1092-1:2018 Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 1: Steel flanges

AISI 316 Stainless Steel

SR EN 10204 Metallic Products: Types of Inspection

API 676 Positive Displacement Pumps - Rotary

DTR-0483 - Field instrumentation

SR EN 60529 – Degrees of protection provided by enclosures (IP Code)

SR EN 61000 – Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards - Emission standard for industrial environments

SR EN 61131 – Programmable controllers

ISO 9000-2015 – Quality management systems - Fundamentals and vocabulary

IEEE 802.3 – Open system interconnection (ISO/OSI Model)

Directiva 2014/30/EU – Directive on Electromagnetic Compatibility - (EMC)

Directive 2014/32/EU – Metering instrumentation Directive (MID).

Directiva 2014/34/EU – Equipment for potentially explosive atmospheres (ATEX)

Directiva 2014/35/EU – Low Voltage Equipment Directive (LVD)

Directiva 2014/68/EU – Pressure Equipment Directive (PED)

SR HD 60364 – Low voltage electrical installations

IEC 60076 – Power transformers

IEC 60034 Rotating electrical machines

SR 1893 Rotary electric cars. Rules and methods to verify quality

SR EN 1092-1:2018 Flanșe și îmbinarea lor. Flanșe rotunde pentru conducte, robinete, racorduri și accesorii desemnate prin PN. Partea 1: Flanșe de oțel

AISI 316 Oțel inoxidabil

SR EN 10204 Produse metalice. Tipuri de documente de inspecție

API 676 Pompe cu deplasare pozitivă -Rotative

DTR-0483 – Instrumente de teren

SR EN 60529 - Grade de protecție asigurate prin carcase (cod IP)

SR EN 61000 – Compatibilitate electromagnetică (CEM). Partea 6-4: Standarde generice. Standard de emisie pentru mediile industriale

SR EN 6113 – Automate programabile

ISO 9000-2015 – Sistemul de Management al calitatii. Principii fundamentale si vocabular

IEEE 802.3 – Interconectarea sistemelor deschise (model ISO/OSI)

Directiva 2014/30/EU – Directiva Compatibilitate Electromagnetica - (EMC)

Directive 2014/32/EU – Directiva privind aparatura de masurare (MID).

Directiva 2014/34/EU – Echipamente si sisteme de protectie destinate utilizarii in atmosfere potential explozive (ATEX)

Directiva 2014/35/EU – Directiva echipamentelor de joasa tensiune (LVD)

Directiva 2014/68/EU – Directiva echipamente sub presiune (PED)

SR HD 60364 – Instalatii electrice de joasa tensiune

IEC 60076 – Transformatoare de putere

IEC 60034 Masini electrice rotative

SR 1893 Mașini electrice rotative. Reguli și metode pentru verificarea calității

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IEC 61800 (series) – Adjustable speed electrical power drive systems;

SR EN 60947-2 - Low Voltage switchgear and controlgear. Part 2: Circuit breakers

SR EN 61140 – Protection against electric shocks. Common aspects for installation and equipment.

IEC 60050 – International electrotechnical vocabulary.

All equipment supplied shall be in accordance with Romanian norms and OMV Petrom company standards.

Alternative Codes can be used if there is a proven economic incentive. To use alternative code will require written acceptance by Company.

In all cases the alternative Design Code shall be complied with fully in addition to the requirements stated in EU Directive 2014/68/UE (where is applicable).

IEC 61800 (serie) – Sisteme de actionari electrice cu turatie variabila;

SR EN 60947-2 - Aparatură de joasă tensiune. Partea 2: Întrerupătoare

SR EN 61140 – Protecție împotriva șocurilor electrice. Aspecte comune pentru instalare și echipamente.

IEC 60050 – Vocabular electrotehnic international.

Toate echipamentele furnizate trebuie sa fie in concordanta cu normele romanesti si cu standardele companiei OMV Petrom.

Codurile alternative pot fi utilizate daca demonstreaza un interes economic. La utilizarea codurilor alternative va fi necesar un acord scris de accept din partea Companiei.

In toate cazurile, codurile alternative de proiectare trebuie sa corespunda in totalitate cu cerintele stabilite in Directiva europeana 2014/68/UE (unde se aplica).

3.2 PROJECT DOCUMENTS REFERENCE / DOCUMENTE DE REFERINTA DE PROIECT

TFP3O-D-TUV-A-FD-001 Basis of Design

TFP3O-D-TUV-A-FD-002 Design Philosophies

TFP3O-D-TUV-P-XB-001 P&ID

TFP3O-D-TUV-E-SA-003 Specification for induction motor

TFP3O-D-TUV-E-SA-003 VSD Technical specification

TFP3O-D-TUV-A-FD-001 Bazele proiectarii

TFP3O-D-TUV-A-FD-002 Filozofii De Proiectare

TFP3O-D-TUV-P-XB-001 P&ID

TFP3O-D-TUV-E-SA-003 Specificatie tehnica motoare cu inductie

TFP3O-D-TUV-E-SA-003 Specificatie tehnica VSD

4. SCOPE OF THE SUPPLY / FURNITURA

4.1 GENERAL DESCRIPTION / DESCRIERE GENERALA

This document contains general requirements for the Oil Export Pumping Skid including the associated field devices, instrument and electrical part.

Prezenta specificatie contine cerinte generale ale Skidului de Pompare Titei, impreuna cu sistemele auxiliare, instrumentatia si partea electrica.

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The Supplier shall be responsible for the Oil Export Pumps Skid bid.

The Oil Export Pumps Skid provided by the supplier shall be in all respects in the current range of production and should not allow the use of prototype equipment or subassemblies.

The Supplier, based on his experience and specialization, shall integrate or update the reference standards, according to the type of system and instrument that he deals with. The compliance with this specification Codes and Standards does not relieve the Supplier from his responsibility related to the supply of equipment, materials and accessories adequately designed and manufactured and perfectly fit for the specified requirements, operating conditions and functioning warranties.

All materials and equipment furnished by the Supplier shall be new, unused, and undamaged and shall meet specification.

The Supplier shall appoint a single contact point who shall take overall responsibility for all aspects of the project.

The supplier shall send a detailed offer with complete documents with sizes, weights, required utilities, respectively P&ID and operating technical specification for the Oil Export Pumps Skid.

FURNIZORUL poarta intreaga responsabilitate pentru Skidul de Pompare Titei oferat.

Skidul de Pompare Titei oferit de catre FURNIZOR trebuie sa fie, din toate punctele de vedere, in gama curenta de fabricatie si nu trebuie sa includa utilizarea echipamentelor sau subansamblurilor prototip.

Furnizorul, pe baza experienței și specializării sale, va integra sau actualiza standardele de referință, în funcție de tipul de sistem și instrumente cu care se ocupă. Respectarea Codurilor și Standardelor din prezenta specificație nu exonerează Furnizorul de responsabilitatea sa legată de furnizarea de echipamente, materiale și accesorii proiectate și fabricate adecvat și perfect potrivite pentru cerințele specificate, condițiile de funcționare și garanțiile de funcționare.

Toate materialele și echipamentele folosite de Furnizor vor fi noi, nefolosite și nedeteriorate și vor respecta specificația.

Furnizorul va numi un singur punct de contact care își va asuma responsabilitatea generală pentru toate aspectele proiectul.

Furnizorul va transmite o oferta detaliata cu documente complete cu dimensiuni, greutate, utilitati necesare, respectiv P&ID si Specificatia tehnica de functionare pentru Skidul de Pompare Titei.

4.2 DEVIATIONS FROM TECHNICAL REQUIREMENTS OF THIS SPECIFICATION / DEVIATII DE LA CERINTELE ACESTEI SPECIFICATII TEHNICE

All deviations from this document requirements, referred project specifications, national and international codes and standards have to be highlighted in a document included in the bid. In the absence of this document or a statement included in the document, it shall be deemed that there are no deviations and that all provisions have been met in full.

Adhering to, compliance with and complete fulfillment of all the provisions included in this document, the specifications of the project referred

Toate deviatiile de la cerintele acestui document, specificatiile de proiect la care face referire, Coduri si Standarde nationale si internationale trebuie sa fie evidentiata printr-un document inclus in oferta. In absenta acestui document sau a unei declaratii incluse in document, se va presupune ca nu exista deviatii si ca toate prevederile au fost indeplinite integral.

Aderarea, insusirea si indeplinirea integrala a tuturor prevederilor incluse in acest document, specificatiile de proiect la care face referire, Coduri

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to, national and international Codes and Standards, do not relieve the supplier from its responsibility to supply equipment of adequate quality, properly designed and manufactured, capable of meeting the specified operating conditions while complying with the operational safety, health and environment protection rules.

si Standarde nationale si internationale, nu scuteste FURNIZORUL de responsabilitatea furnizarii echipamentelor de o calitate corespunzatoare, proiectate si realizate corespunzator, capabile sa indeplineasca conditiile de operare specificate, concomitent cu respectarea regulilor privitoare la siguranta in exploatare, sanatate si protectie a mediului ambiant.

5. GENERAL DESCRIPTION / DESCRIERE GENERALA

The Supplier shall furnish a complete system that includes the following equipment/ materials and services:

- Complete Oil Export Pumping package delivered by the supplier on skid, consisting of:
 - 2 oil pumps (1 active / 1 spare) equipped with electric motor and VSD (see attached data sheet;
 - oil strainers mounted in pumps suction, provided with quick opening and differential pressure transmitters;
 - pressure relief valves mounted on the discharge of each pump
 - check valves mounted on the discharge of each pump
 - isolation valves mounted on the suction and the discharge of each pump
 - suction and discharge interconnecting pipes, drains, up to skid limits, including supports.
 - electrical cables from motor(s) to Skid Junction box(es)
 - skid earthing connections (min 2 on oposite corners) – location will be provided later
 - instrumentation for pumps protection (skid);
 - Instrumentation cables from instrument(s) to Skid Junction box(es)
 - electrical heat tracing system on skid (piping and pumps)

Furnizorul va livra un sistem complet care include următoarele echipamente/ materiale și servicii:

- Pachet complet Skid de Pompate Titei curat livrat de furnizor pe skid, continand:
 - 2 pompe titei (1 activa / 1 rezerva) echipate cu motor electric si VSD (fezi foaie de date atasata);
 - filtre titei montate pe aspiratia pompelor, prevazute cu deschidere rapida si tradusctoare de presiune diferentiala;
 - Supape de siguranta montate pe refularea fiecarei pompe
 - Robinete de retinere montate pe refularea fiecarei pompe
 - Robinete de izolare montate pe aspiratia si refularea fiecarei pompe
 - conducte de aspiratie si refulare, scurgeri, pana la limita skid-ului, inclusiv suport
 - cabluri electrice de la motoare la cutiile de conexiuni ale skid-ului
 - legături de legare la pământ (min 2 pe colțurile opuse) – locația va fi furnizată ulterior
 - instrumentatie pentru protectia pompelor (skid);
 - cabluri de la instrumentatie la cutiile de conexiuni ale skid-ului
 - sistem de insotire electrica pe skid (conduce si pompe);

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- cabinets and electrical and instrumentation devices related to the skid.

-Skid lifting lugs

- dulapuri si dispozitive electrice si de instrumentatie aferente skidului.

- manere de ridicare a skid-ului

5.1 GENERAL REQUIREMENTS / CERINTE GENERALE

The Oil Export Pumping Skid is continuous and dynamic operation.

- Suction from the OMS buffer tank (OMS is also equipped with a booster pump). START OMS will be the permissive condition for starting the pump, and STOP OMS will also represent the STOP command for the delivery pump.
- Direct suction from the tanks (through OMS bypass).

The pumping skid will be stopped, through the SIS, at the low low level and low low pressure in the tanks and by specific signals coming from the OMS.

The Oil Export Pumping Skid must automatically react to all commands/inputs in the installation, as necessary: during normal operation as well as during the test phase. There must also be a manual mode for such operations.

The Oil Export Pumping Skid will not be provided with a by-pass line.

Operarea Skid-ului de Pompare Titei va putea fi facuta in doua moduri:

- Aspiratie din vasul tampon al OMS (OMS este prevazut si cu pompa booster). START OMS va fi conditie permisiva de pornire pompa, iar STOP OMS va reprezenta si comanda de STOP pentru pompa de livrare.
- Aspiratie directa din rezervoare (prin by-passarea OMS).

Skid-ul de pompare va fi oprit prin SIS la nivel minim minimorum si presiune minim minimorum in rezervoare si de semnale specifice venite de la OMS.

Skidul de Pompare Titei trebuie să reactioneze automat la toate comenzile/intrarile din instalatie, după cum este necesar: în timpul funcționării normale cat si în timpul fazei de testare. Trebuie să existe și un mod manual pentru astfel de operațiuni.

Skidul de Pompare Titei nu va fi prevazut cu linie de by-pas.

5.2 MAINTENANCE REQUIREMENTS / CERINTE PRIVIND INTRETINEREA

Field instrumentation will be selected in order to reduce the need for maintenance and calibration activities.

Easy access to components for calibration and maintenance scheduled activities shall be ensured. Devices to ease calibration work shall be included.

All installed equipment will be provided with operation and maintenance sheets, which will be issued on a durable support and displayed in a visible place, together with the maintenance charts.

The contractor has the responsibility of verifying all the documentation delivered by the Supplier and to request their completion, as the case.

Instrumentatia din teren se va selecta astfel incat sa se reduca necesitatea activitatilor de intretinere si calibrare.

Va trebui ca accesul la componente sa nu fie ingreunat, in vederea desfasurarilor activitatilor regulate de calibrare si intretinere. Se vor include dispozitive care sa usureze lucrarile de calibrare.

Toate echipamentele instalate vor fi prevazute cu fise de operare si intretinere, care vor fi emise pe suport rezistent si afisate in loc vizibil, alaturi de graficele de intretinere.

Executantul are responsabilitatea verificarii intregii documentatii livrate de Producator si sa solicite completarea ei, dupa caz.

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Based on this documentation, the contractor will have to complete the annexes of the operation and maintenance manual with spare and spare parts, as well as the list of materials, with sufficient technical information for unique identification and loading in SAP.

In baza acestei documentatii executantul va trebui sa completeze anexele manualului de operare si mentenanta cu piesele de schimb si de rezerva, precum si lista de materiale, cu informatii tehnice suficiente pentru identificarea unica si incarcare in SAP.

5.3 LAYOUT REQUIREMENTS / CERINTE PRIVIND AMPLASAREA

Bearing in mind that this skid will be integrated into an already designed installation, its location will be realized in the space reserved for it.

Avand in Vedere ca acest skid se va integra intr-o instalatie deja proiectata, amplasarea lui se va realiza in spatiul rezervat pentru acesta.

The battery limits of the skid are:

- Suction skid inlet DN150/PN16;
- Discharge skid outlet DN150/PN40;
- Drainage skid outlet DN50/PN16.

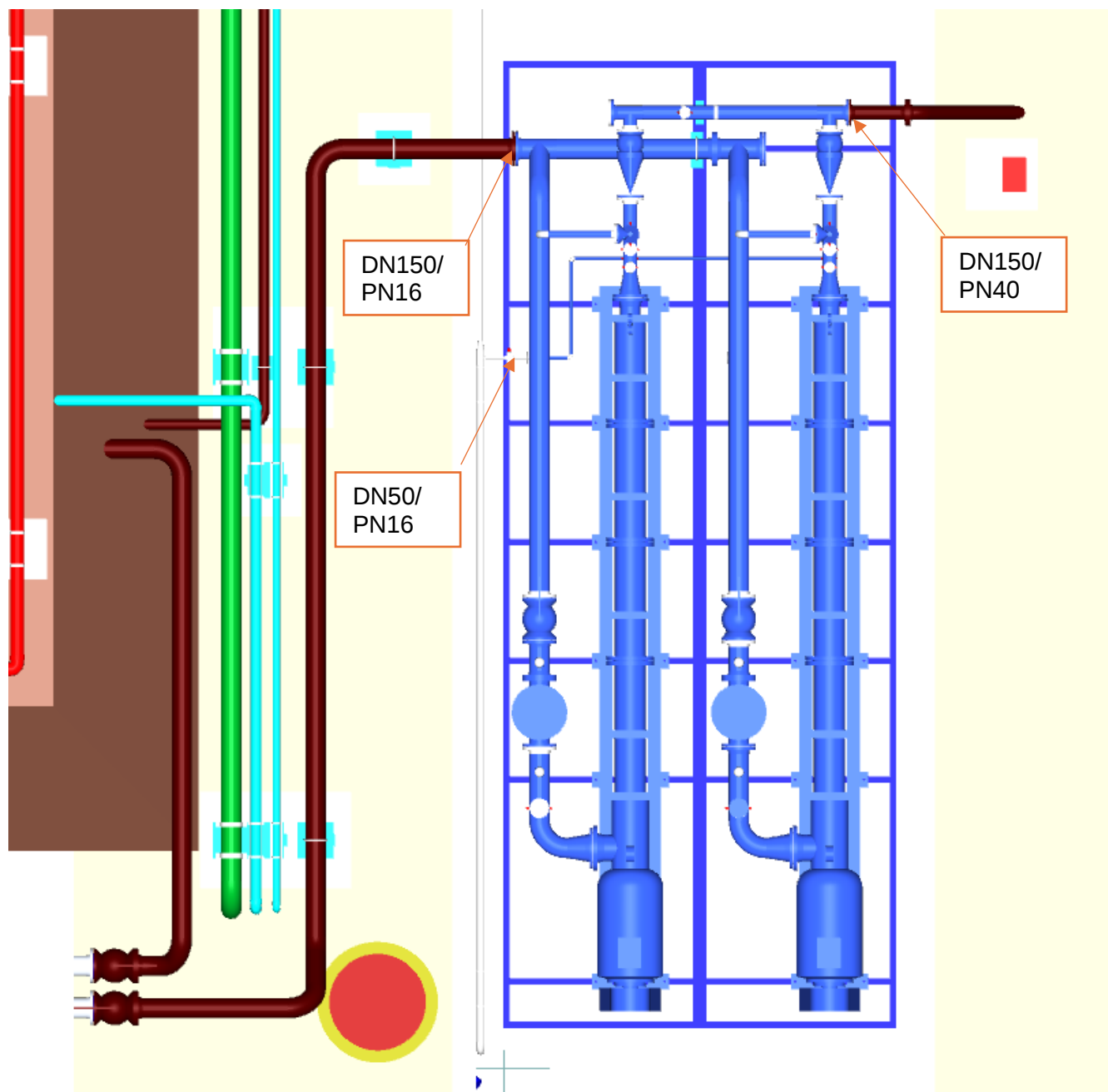
See the location suggestion capture below.

Limitele de baterie ale skidului sunt:

- Intrare skid aspiratie DN150/PN16;
- Iesire skid refulare DN150/PN40;
- Iesire collector scurgeri DN50/PN16

Vezi mai jos captura sugestie de amplasare.

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5.4 ENVIRONMENTAL CONDITIONS / CONDITII DE MEDIU

The location is part of a continental climate sector and is characterized by the following specific elements:

Amplasamentul se incadreaza intr-un sector de clima continentala si se caracterizeaza prin urmatoarele elemente specifice:

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Reference STD*		Values			
Environmental Loads Characteristic Values					
Wind Load	SR EN 1991-1-4:2006	Fundamental value of the basic wind velocity ($v_{b,0}$) and/or	$v_{b,0} =$	30	m/s
	SR EN 1991-1-4:2006/NB:2007	Wind dynamic pressure reference value (q_b)	$q_b =$	0,5	kPa
	CR 1-1-4/2012				
Snow Load	SR EN 1991-1-3:2005	Characteristic value of snow load on ground	$S_k(S_{0,k}) =$	2,00	kN/m ²
	SR EN 1991-1-3:2005/NA:2006				
	CR 1-1-3-2012				
Outdoor Air Temperature	SR EN 1991-1-5:2004	Min. =		-26	°C
	SR EN 1991-1-5:2004/NA:2008	Max. =		+40	°C
	Data from Local Meteorological Institutes	Average =		+10	°C
		No. of days with temperature below 0 ⁰			Day(s)
Outdoor Air Humidity **		Min =		60	%
		Max =		100	%
Frost Depth	STAS 6054-77			90	cm
Rainfall	STAS 9470/1973	Diagram no		7	
	Data from Local Meteorological Institutes				mm/mp
SEISMIC DESIGN PARAMETERS*					
Design Peak Ground Acceleration	SR EN 1998-1:2004	Horizontal component	$a_g =$	0.25g***	m/s ²
	SR EN 1998-1:2004/NA:2008	Vertical component	$a_{gv} = 0.7a_g$	0.175g***	m/s ²
Ground Type (horizontal)		$T_c =$	1.0	s	
Response Spectra		P100-1/2013	Ground Type (vertical)	$T_{cv} = 0.45 * T_c$	0.45

Table 1 – Environmental data

Note:

* Local Applicable Standards (Design Codes)

** For Air filters selection 100% humidity shall be considered

*** $g = 9.81 \text{ m/s}^2$

For standardization, the values highlighted can be used for both locations.

For Seismic Design, the biggest peak ground acceleration would cover the design in the other location, of course, but, as far as the response spectra, the design depends on each structure's flexibility.

*According to Local Applicable Standards (Design Codes), applicable for the project site location. Latest version shall be used.

* Conform standardelor locale aplicabile (coduri de proiectare), aplicabile pentru amplasamentul proiectului. Se va utiliza cea mai recenta versiune.

5.5 UTILITY SUPPLY / UTILITATI

The supplier shall specify all required utilities including power consumption and pressure required to operate and maintain the Oil Pumping Skid.

Furnizorul va specifica toate utilitatile necesare inclusiv puterea consumata necesara pentru exploatarea si intretinerea Skidului de Pompare Titei.

5.6 LIFETIME / DURATA DE VIATA

The lifetime of new facilities, including mechanical equipment, piping, electrical equipment, measurement and control

Durata de viata pentru instalatiile noi, incluzand echipamente mecanice, conducte, echipamente

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equipment, construction works shall be 25 years.

Therefore, the Vendor must consider providing equipment with minimized Mean Time to Repair.

electrice, echipamente masura si control, lucrari de constructii va fi de 25 de ani.

Prin urmare, vânzătorul trebuie să ia în considerare furnizarea echipamentului cu timpul mediu de reparatii minimizat.

6. TECHNICAL REQUIREMENTS / CERINTE TEHNICE

6.1 DESIGN DATA / DATE DE OPERARE

The operating parameters of the Oil Pumping Skid are as follows:

$Q_{max} = 70 \text{ m}^3/\text{h}$

$Q_{min} = 25 \text{ m}^3/\text{h}$

$Q_{normal} = 60 \text{ m}^3/\text{h}$

Inlet pressure = $0.01 \div 3 \text{ barg}$ (depending on operating mode, see cap. 5.1)

Outlet pressure = 35 barg

Temperature = $25 \div 45 \text{ }^\circ\text{C}$

Density = $888.8 \div 822.4 \text{ kg/m}^3$

Viscosity = $17.24 \text{ cP @ } 35^\circ\text{C}$

$97.76 \text{ cP @ } 5^\circ\text{C}$

Vapor pressure = $0.9456 \div 1.164 \text{ bara}$

NPSHa = 2.2 m (for the worst case scenario, suction directly from the tank)

Parametrii de funcționare ai Skidului de Pompare Titei sunt dupa cum urmeaza:

$Q_{max} = 70 \text{ m}^3/\text{h}$

$Q_{min} = 25 \text{ m}^3/\text{h}$

$Q_{normal} = 60 \text{ m}^3/\text{h}$

Presiune intrare = $0.01 \div 3 \text{ barg}$ (functie de modul de operare, vezi cap. 5.1)

Presiune iesire = 35 barg

Temperatura = $25 \div 45 \text{ }^\circ\text{C}$

Densitatea = $888.8 \div 822.4 \text{ kg/m}^3$

Viscozitatea = $17.24 \text{ cP @ } 35^\circ\text{C}$

$97.76 \text{ cP @ } 5^\circ\text{C}$

Presiunea de vaporii = $0.9456 \div 1.164 \text{ bara}$

NPSHa = 2.2 m (pentru situatia cea mai defavorabila, aspiratie direct din rezervor)

6.2 MECHANICAL EQUIPMENT / ECHIPAMENTE MECANICE

Mechanical equipment shall comply with SR EN 13445 and Company standards.

The pipes are carbon steel with dimensions according to SR EN 13480. A special attention should be paid to their internal diameter, which should not differ by more than $\pm 1\%$ of the inner diameter of meters.

All pipe connections shall be flanged and shall be done using Flanges SR EN 1092-1, Welding neck (type 11), min PN16, Raised face (type B1), smooth finish surface ($Ra 3,2 - 12,5$).

Echipamentele mecanice trebuie sa fie conform SR EN 13445 si standardelor Companiei.

Conductele vor fi din otel carbon, cu dimensiuni conform SR EN 13480. O deosebita atentie trebuie sa se acorde diametrului interior al acestora, care nu trebuie sa difere cu mai mult de $\pm 1\%$ din diametrul interior al contoarelor.

Toate racordurile țevilor vor fi flanșate și se vor realiza folosind flanșe cu gat (tip 11) SR EN 1092-1, min PN16, Față înălțată (tip B1), suprafață de finisare netedă ($Ra 3,2 - 12,5$).

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All welds will be tested by non-destructive methods: radiographic and ultrasonic testing.

The list of connection points between the package and the designed installation are as follows:

- TP_suction header – DN150/PN16;
- TP_discharge header – DN150/PN40;
- TP_leakage header – DN50/PN16

Toate sudurile se vor testa prin metode nedistructive: radiografieri sau testare cu ultrasunete.

Lista puncte de conexiune dintre pachet si instalatia proiectata sunt dupa cum urmeaza:

- TP_colector aspiratie – DN150/PN16;
- TP_colector refulare – DN150/PN40;
- TP_colector scurgeri echip. – DN50/PN16

6.3 SKID, STRUCTURAL AND BASEPLATE / SKID, CONSTRUCTIE SI PLACA DE BAZA

Vents and drains shall be provided at highest respectively lowest points in the piping system, with the drains directed towards the skid edge.

The skid shall be suitable for outdoor installation. It will be protected against corrosion in order to withstand the outdoor conditions at least 20 years without maintenance.

The configuration of the Oil Pumping Skid shall meet the requirements and comply with the dimensional constraints.

The Supplier shall propose a design within these constraints that combines compactness with compliance with quoted standards and codes, and ensures maintainability of equipment.

The equipment shall be designed to weigh as little as possible without degrading safety, environmental performance or efficiency. The Supplier shall identify equipment mass, centre of gravity in relation to plan, and elevation for all assembled skid units.

The Oil Pumping skid shall be of all-welded steel construction with a rigid base. The baseplate shall be adequately supported. Lifting facilities shall be provided as part of the skid and these shall allow the complete assembly to be lifted without causing permanent deformation or damage to the

Aerisirile si scurgerile vor fi prevazute in cele mai inalte respectiv joase puncte din sistemul de conducte tehnologice, scurgerile fiind directionate catre marginea skidului.

Constructia skidului va fi corespunzatoare pentru montaj in aer liber. Se va proteja anticoroziv pentru a rezista in aer liber cel putin 20 de ani fara mentenanta.

Configuratia Skidului de Pompate Titei va intruni cerintele si va respecta limitarile de gabarit.

Furnizorul va propune un model cu respectarea acestor limite, un model compact care sa respecte standardele si codurile enumerate si care sa permita intretinerea echipamentelor.

Echipamentele se vor proiecta astfel incat sa cantareasca cat mai putin fara ca acest lucru sa aiba impact asupra sigurantei, performantei de mediu sau randamentului. Furnizorul va identifica masa echipamentelor, centrul acestora de greutate in raport cu planul si elevatia pentru toate modulele asamblate pe skid.

Skidul de Pompate va avea structura din otel sudat si o baza rigida. Placa de baza va fi sprijinita corespunzator. Piese/dispozitivele de ridicat vor fi puse la dispozitie ca parte a skidului si acestea vor permite ridicarea intregului ansamblu fara deformarea permanenta sau deteriorarea skidului sau a oricarui echipament montat pe acesta.

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skid or to any of the equipment mounted on the skid.

The configuration of the pumping skid shall meet the following requirements:

Importance - exposure class „III” according to Annex 1 of CR 0/2012 "Design Code. Basics of Construction Design

The importance factor - exposure related to the action of snow, wind and earthquake is 1, according to importance class III.

Importance category „C” acc.: HG 766-97.

The skid structure (base) shall be designed to allow the installation and anchoring on foundation

The supplier must offer the information about the diameter of the anchor bolts, Foundation loads empty, operation, test conditions, material, type and footprint.

The skid structure must handle the equipment in operation and transportation, considering also the loads of the ambient and the seismic action over the installation location.

Vents and drains shall be provided at highest respectively lowest points in the piping system, with the drains directed towards the skid edge.

The skid shall be suitable for outdoor installation. It will be protected against corrosion in order to withstand the outdoor conditions at least 20 years without maintenance.

Structura skidului trebuie sa respecte urmatoarele cerinte:

Clasa de importanta - expunere „III” conf. Anexa 1 din CR 0/2012 "Cod de Proiectare. Bazele Proiectarii Constructiilor";

Factorul de importanta - expunere aferent actiunii zapezii , vantului si seismului este 1, conform clasei de importanta III.

Categoria de importanta „C” conf. HG 766-97.

Structura skidului (baza) trebuie sa fie proiectata astfel incat sa poata fi montat si ancorat pe o fundatie.

Furnizorul trebuie sa ofere informatii despre diametrul buloanelor de ancorare, încărcări ale fundației pentru echipament gol, in funcționare, in condiții de testare, material, tip și amprentă la sol.

Structura skidului trebuie sa sustina echipamentul in operare si transport, considerand de asemenea incarcările mediului ambiant precum si actiunea seismului pentru locatia in care se monteaza.

Aerisirile si scurgerile vor fi prevazute in cele mai inalte respectiv joase puncte din sistemul de conducte tehnologice, scurgerile fiind directionate catre marginea skidului.

Constructia skidului va fi corespunzatoare pentru montaj in aer liber. Se va proteja anticoroziv pentru a rezista in aer liber cel putin 20 de ani fara mentenanta.

6.4 PROCESS OPERATOR INTERFACE / INTERFATA OPERATORULUI DE PROCES

The process operator interface shall as a minimum comprise:

- graphic user interface,
- pumping run control,
- security control of operator entered parameters,

Interfața operatorului de proces trebuie să cuprindă cel puțin:

- interfata grafica cu utilizatorul,
- controlul rulării pomparii,
- controlul de securitate al parametrilor introduși de operator,

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- alarm handling.

The pump control panel will receive signals from the OMS and PCS (tank levels, START, STOP), as well as from the pump VSDs. The control panel will also manage ESD actions regarding the emergency shutdown of the pumps.

The local panel will be equipped with a Modbus communication module, and the vendor will provide the list of all Modbus registers required for SCADA communication.

- gestionarea alarmelor.

Panoul de control al pompelor va prelua semnalele de la OMS si de la PCS (nivele rezervoare, START, STOP), precum si de la VSD-urile pompelor. De asemenea panoul de control va gestiona si actiunile ESD privind oprirea in regim de urgenta a pompelor.

Panoul local va fi echipat cu modul de comunicatie Modbus, iar vendorul va transmite lista cu toti registrii Modbus necesari pentru comunicarea in SCADA.

6.5 ALARMS / ALARME

The alarm system shall raise alarms, print out alarms and/or save alarms to external file, if any comparison check exceeds operator selected limits or if any measured value is outside predetermined limits or in case of indication of instrument failure, computer failure or failure in pump operation.

The alarm system shall be designed in a flexible way, fulfilling as a minimum the following requirements:

- for all alarms it must different password-based access levels will be mentioned, for setpoint modification, alarm thresholds, inhibition;
- a list of all suppressed alarms shall be available on screen and printer and external file;
- grouping of alarms shall be considered in order to reduce the number of alarms to a minimum;
- hardware and software watchdog alarm shall be implemented.

Sistemul de alarmă trebuie să declanșeze alarme, să imprime alarme și/sau să salveze alarme într-un fișier extern, dacă orice verificare de comparație depășește limitele selectate de operator sau dacă orice valoare măsurată este în afara limitelor determinate sau în cazul indicării unei defecțiuni a unui instrument, a computerului sau în funcționarea unei pompe.

Sistemul de alarmă va fi proiectat într-un mod flexibil, îndeplinind cel puțin următoarele cerințe:

- pentru toate se va mentiona nivele diferite de acces pe baza de parola, pentru modificare setpoint, praguri de alarmare, inhibare;
- o listă cu toate alarmele suprimate va fi disponibilă pe ecran și imprimantă și fișier extern
- se va avea în vedere gruparea alarmelor pentru a reduce numărul de alarme la minimum;
- se va implementa alarma de supraveghere hardware si software.

6.6 ELECTRICAL POWER DISTRIBUTION / DISTRIBUȚIA ENERGIEI ELECTRICE

Supplier shall provide the electrical distribution system incorporating all necessary breakers and protections. This will be supplied with

Furnizorul va furniza sistemul de distribuție electrică care încorporează toate întreruptoarele și protecțiile necesare. Alimentarea cu energie

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electricity at the voltage level of 400/230 V a.c., 50 Hz, TN-S system.

Suitable terminal blocks shall be provided in the cabinet for electrical power connection. Internal dc distribution shall be done by Supplier with dedicate automatic feeder for each equipment\instrument.

Convenience outlet socket shall be provided in each cabinet, 230V a.c.

electrică a acestuia se va face la nivelul de tensiune de 400/230 V a.c., 50 Hz, sistem TN-S.

În dulap trebuie să fie prevăzute blocuri de borne adecvate pentru conectarea la energie electrică. Distribuția internă de c.c. se va face de către Furnizor cu un alimentator automat dedicat pentru fiecare echipament/instrument.

În fiecare dulap trebuie prevăzută o priză 230V c.a.

6.7 EARTHING AND LIGHTING / LEGAREA LA PAMANT

All instrument chassis ground shall be connected to one bar (Safety Eathing System) while signal grounds shall be connected to the other bar (Functional Eathing System).

Ground wiring shall be connected to the ground bar by means of suitable wire lugs, use of intermediate terminals shall be minimized.

Provisions shall be made for connection of the ground bars to the Company's Earthing system. The earthing system shall meet all all-electrical code requirements in order to provide a safe system.

Provision shall be made for terminating earth continuity cabinet links (by Supplier) and main earthing conductors (by Company).

The supplier shall specify his system Earthing requirements.

Toate carcasele instrumentelor trebuiesc conectate la o singura bara (Sistem de legare la pamant sigur) in timp ce semnalele se vor lega la o bara separata (Sistem de legare la pamant functional).

Cablurile de legare la pamant se vor conecta la conductorul de legare la pamant prin intermediul unor papuci corespunzatori, se va reduce utilizarea clemelor.

Se va prevedea conectarea conductoarelor de legare la pamant la instalatia de legare la pamant a instalatiei.

Legarea la pamant va respecta cerintele cuprinse in codurile electrice, va oferi un sistem sigur si nu va permite ca zgomotele electrice sa afecteze semnalele de comanda.

Furnizorul va specifica cerintele de legare la pamant pentru propriul sistem.

6.8 CABLING / CABLAREA

Within package battery limit, cabling of all electrical and control items including fastening, connection, labelling and testing is in VENDOR scope of supply.

Power supply cables as incoming to package distribution board/ power & control panel are excluded.

Cables/wires shall be selected according to load, insulation level, function and operating.

În limita bateriei pachetului, cablarea tuturor elementelor electrice și de control, inclusiv fixarea, conexiunea, etichetarea și testarea se află în domeniul de furnizare a VENDORULUI.

Sunt excluse cablurile de alimentare care intră în panoul de distribuție/panoul de alimentare și de control al pachetului.

Cablurile/firele vor fi selectate în funcție de sarcină, nivel de izolație, funcție și funcționare.

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Copper cables shall be used, with PVC or XLPE insulation. Outer sheet shall be flaming retardant and hydrocarbon resistant.

The electrical cable glands (power, PTC, anti-condensation resistors) will be delivered by the package supplier. The specifications of the glands will be provided during the bidding phase.

6.9 CABINETS / DULAPURI

The PLC and VSD cabinets/cabinets will be installed in a dedicated container, which will be located in the unclassified area. The container will be equipped in accordance with the proper functioning of the equipment in temperature and humidity conditions, according to their data sheets.

Live parts of equipment and terminations carrying voltages above 50 volts shall be covered with a transparent insulation plate bearing the warning text: DANGER.

All markings shall be clear and durable.

Se vor folosi cabluri de cupru, cu izolație PVC sau XLPE. Mantaua exterioara trebuie să fie ignifugă și rezistentă la hidrocarburi.

Presetupele cablurilor electrice (alimentare, PTC, rezistente anti condens) vor fi livrate de catre furnizorul pachetului. Se vor pune la dispozitie in faza de ofertare specificatiile presetupelor.

Dulapurile/cabinetele aferente PLC si VSD se vor instala intr-un container dedicat, care se va amplasa in zona neclasificata. Containerul va fi echipat corespunzator privind buna functionare a echipamentelor in conditiile de temperatura si umiditate, conform foilor de date ale acestora.

Partile sub tensiune ale echipamentelor si conexiunile cu tensiuni mai mari de 50 V se vor acoperi cu o placuta izolatoare transparenta pe care se va inscripționa PERICOL.

Inscriptionarile vor fi clare si durabile.

6.10 LOCATION AND DIMENSIONS / AMPLASARE SI DIMENSIUNI

The Clean Oil Pumping Skid will be installed in the open air and mounted on a concrete platform provided with a ledge to collect accidental spills.

Its integration into an already designed installation involves execution/assembly recommendations according to the estimated location space.

The dimensions of the skid will be established by the supplier and must fit within the transportable diomensions.

Skidul de Pompare Titei Curat va fi instalat in aer liber si se va monta pe o platforma betonata prevazuta cu rebord pentru preluarea scurgerilor accidentale.

Integrarea acestuia intr-o instalatie deja proiectata, implica recomandari de executie/montaj conform spatiului de amplasare estimat.

Dimensiunile skidului vor fi stabilite de furnizor si vor trebuie sa se incadreze in dimensiunile transportabile.

6.11 UTILITIES AND FACILITIES / UTILITIATI SI FACILITIATI

The following electrical supplies will be available at 400 VAC 50Hz, 3ph.

Va fi necesara disponibilitatea urmatoarelor utilitati electrice: 400/230 Vca 50 Hz 3 faze.

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The electricity supply will be made by the Beneficiary from the electrical distributor that serves all the consumers of the installation, more precisely from the section that feeds the essential consumers, which in case of interruption of the network voltage will be fed by means of the ATS system from a diesel generator.

The following panels/ cabinets shall be provided by Supplier:

- distribution from UPS for control equipment (PLC, instrumentation, PC, fed from the vital consumer panel-UPS)

The supplier shall calculate the expected load, for each supply voltage, with a 30% allowance for future expansion. All distribution boards shall have 30% spare capacity for future expansion.

The protection of power circuits shall be provided in both live and neutral lines and shall be either switches/fuses or MCB's. It shall be possible to "lock off" an isolated circuit. Cables entering distribution boards shall be terminated at suitably sized and rated terminals.

Electrical power and instrument signal cables shall enter and leave the Container via separate cable transits mounted in the Container walls.

All internal cabling shall be protected in metallic or plastic conduits. Adequate separation of signal levels and voltage shall be maintained to ensure signal integrity.

Alimentarea cu energie electrica se va face de catre Beneficiar din distribuitorul electric care deserveste toti consumatorii instalatiei, mai precis din sectia care alimenteaza consumatorii esentiali, care in caz de intrerupere a tensiunii retelei vor fi alimentati prin intermediul sistemului ATS de la un generator disel.

Urmatoarele dulapuri vor fi puse la dispozitie de furnizor:

- Distributie pentru echipamentele de comanda (PLC, instrumentatie, PC, alimentate din tabloul de consumatori vitali-UPS)

Furnizorul va calcula consumul estimat pe fiecare tensiune de alimentare cu o rezerva de 30% pentru extindere ulterioara. Toate tablourile de distributie vor avea capacitate de rezerva de 30% pentru extindere ulterioara.

Se va prevedea protectia circuitelor de alimentare atat pe linia activa cat si pe nul si trebuie sa fie intrerupatoare/sigurante sau MCB's. Va exista posibilitatea de a izola fiecare circuit. Cablurile care intra in tablourile de distributie se vor conecta la borne dimensionate corespunzator.

Cablurile electrice si de automatizari vor intra si vor iesi din camera prin penetrari separate montate in peretii containerului (se vor segrega).

Toate cablurile interioare se vor proteja in canale metalice sau de plastic. Se va pastra separarea corespunzatoare nivelurilor de semnal si a tensiunilor astfel incat sa se asigure integritatea semnalelor.

7. ENVIRONMENTAL REQUIREMENTS / CERINTE DE MEDIU

All equipments units have to fulfil the national regulations concerning the noise emissions of max. 85 dB(A). As objective the noise emission of the unit should be as low as possible.

Typical noise data regarding the noise level of the equipment to be provided.

Toate echipamentele trebuie să îndeplinească reglementările naționale privind emisiile de zgomot de max. 85 dB(A). Ca obiectiv, emisia de zgomot a unității ar trebui să fie cât mai scăzută posibil.

Date tipice de zgomot privind nivelul de zgomot al echipamentului care urmează să fie furnizat.

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It is the vendor's responsibility to consider the suitable safe location for any local process vent within the package.

Este responsabilitatea vânzătorului să ia în considerare locația sigură potrivită pentru orice ventilație de proces local din pachet.

8. QUALITY ASSURANCE, INSPECTION AND TESTING / ASIGURAREA CALITATII, INSPECTIE, TESTARE

8.1. QUALITY ASSURANCE / ASIGURAREA CALITATII

The Supplier shall be certified according to EN ISO 9001. The supplier shall issue a Quality Assurance Plan according to the aforementioned standard covering all quality assurance activities starting from the receipt of the purchase order until the handover to the Supplier.

The Company (or its representative) reserves the right to verify the capabilities and reliability of any proposed Sub-Contractor by requesting detailed information or auditing.

A typical inspection plan covering the entire supply will be delivered during the bidding phase.

Furnizorul va fi certificat conform EN ISO 9001. Furnizorul va transmite un plan de asigurare a calitatii conform standardului antementionat care va include activitatile de asigurare a calitatii incepand de la receptionarea comenzii pana la predarea catre furnizor.

Compania (sau reprezentantul sau) isi rezerva dreptul de a verifica capabilitatile si bonitatea subcontractorilor propusi prin solicitarea de informatii detaliate sau prin audit.

In faza de ofertare se va livra un plan de inspectie tipic care sa acopere intreaga furnitura.

8.2. INSPECTION / INSPECTIE

During the whole period of supply, from the purchase order date to the equipment shipping date, the Supplier shall give reasonable free access to his own and to his subcontractor's offices and workshops for the inspectors of Company and any other party or agency nominated and provide them with all data / information they require to verify the manufacturing schedule and to approve test certifications.

Pe perioada livrării furniturii, începând cu data lansării comenzii și până la data expedierii furnizorul va acorda acces neingradit, în mod rezonabil, la birourile și atelierelor sale și ale subcontractorilor săi, inspectorilor Companiei și oricărei parti sau agentii nominalizate, punându-le la dispoziție toate datele/informatiile de care au nevoie pentru verificarea graficului de execuție și aprobarea certificatelor în urma efectuării testelor.

8.3. TESTING – FACTORY ACCEPTANCE TEST (FAT) / TESTE DE RECEPȚIE ÎN FABRICA (FAT)

The supplier shall execute a proper test program during all stages of fabrication.

The supplier shall present the equipment, as far as possible, for the FAT to simulate its full field operation.

Furnizorul va executa un program corespunzător de testare în toate etapele de fabricație.

Furnizorul va prezenta echipamentele, pe cât posibil, pentru testele de recepție în fabrică, pentru simularea operării în teren.

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The test shall demonstrate that the equipment complies fully with the Purchase order and Technical Specification, including any agreed changes.

In addition to the scheduled tests, the Company will carry out an inspection to ensure that all construction and electrical work is as per the required standards, and is in accordance with good engineering practice.

All test certificates including type test certificates, routine certificates, material certificates are to be provided by Supplier for review and approval by Company.

The Supplier shall carry out the complete range of functional and routine tests required to check the process operating and protection of the package according to the installed equipment: reference shall be made to the project reference inspection data sheet where applicable for the single equipment or material.

Functional and routine tests for the electrical and instrument facilities shall include but not limited to, the following:

- Visual inspection shall be carried out to verify all component quantities and descriptions conform to the approved documentation,
- Earthing points shall be verified for proper installation, earth continuity test;
- Check and test of the protective devices that have been selected and calibrated correctly,
- Check on the degree of protection of assembled components,
- Check on protection against electrical shock due to leakage currents i.e., earthing, special insulation, etc.
- Functional check and simulation of all alarms and indications to ascertain that the installation, components, controls,

Testul va demonstra faptul ca echipamentele corespund in totalitate cu specificatiile tehnice si comanda, inclusiv cu modificarile stabilite.

In plus fata de testele programate, Compania va realiza o inspectie pentru a verifica daca lucrarile de constructii si electrice corespund standardelor si bunelor practici ingineresti.

Toate certificatele de testare, inclusiv certificatele tip, ale testelor de rutina, de materiale vor fi puse la dispozitie de furnizor in vederea analizei si aprobarii acestora de catre Companie.

Furnizorul va face toate testele de rutina si functionale pentru verificarea functionarii procesului si protectia pachetului conform echipamentului instalat: se va face referire la foaia de date de referinta pentru inspectie din cadrul proiectului, unde este cazul pentru un singur echipament sau material.

Testele functionale si de rutina pentru facilitatile electrice si de instrumentatie vor include cel putin urmatoarele:

- Inspectia vizuala pentru verificarea cantitatilor si descrierilor de componente conform documentatiei aprobate,
- Se va verifica instalarea corespunzatoare a punctelor de legare la pamant, testul de continuitate a legarii la pamant;
- Verificarea si testarea dispozitivelor de protectie daca au fost testate si calibrate corect,
- Verificarea gradului de protectie al componentelor asamblate,
- Verificarea protectiei la descarcare electrica datorita curentilor de scurgere, respectiv legare la pamant, izolatii speciale etc.
- Verificarea functionalitatii si simularea tuturor alarmelor si indicatiilor pentru a confirma ca instalarea, componentele, comenzile,

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interlocks, mechanism, etc. operate correctly,

- Routine tests as defined in the appropriate standards and/or recommendations,
- Other checks to ascertain that the package complies with any special requirements.

For the final inspection, the skid will be fully assembled and wired.

interblocările, mecanismul etc funcționează corect,

- Teste de rutină așa cum sunt definite în standarde și/sau recomandări,
- Alte verificări pentru a confirma faptul că pachetul corespunde cerințelor speciale.

Pentru inspectia finală skidul va fi complet asamblat și cablat.

9. GUARANTEES / GARANTII

The Vendor shall include in his offer all services related to providing a minimum warranty period of 36 months from the commissioning of Oil Export Pumping Skid

During the warranty period, the supplier must, at no additional cost to customers, perform all the repairs needed to remedy the defects in devices, etc., occurred as a result of manufacturing or construction defects.

In the event of malfunction, the warranty period should be extended according to the length of time that the equipment did not work, being under repair.

FURNIZORUL trebuie să includă în oferta sa toate serviciile legate de asigurarea unei perioade de garanție de minim 36 luni de la punerea în funcțiune a Skidului de Pompă Titei Curat.

În perioada de garanție, FURNIZORUL trebuie să efectueze, fără costuri suplimentare pentru CLIENT, toate reparațiile care sunt necesare pentru remedierea defectiunilor aparatelor, etc., aparute ca urmare a unor vicii de fabricație sau construcție.

În cazul apariției unor defectuni, perioada de garanție trebuie prelungită corespunzător duratei de timp pe care echipamentele nu au funcționat, fiind în reparație.

10. LABELLING / ETICHETARE

All equipment has to be tagged with a permanent type label, according to the requirements of the applicable guidelines and standards and those of Company. The label has to include at least the following information:

- Manufacturer and manufacturer's sign;
- Manufacturing number;
- Year of construction;
- Allowable / design operating temperature;
- Allowable / design operating pressure;
- Excess pressure for testing;
- CE certification – as required;

Toate echipamentele se vor inscripționa cu etichete permanente, conform cerințelor cuprinse în instrucțiunile și standardele aplicabile și cele ale Companiei. Se vor inscripționa cel puțin următoarele informații:

- Fabricantul și sigla acestuia;
- Numărul de fabricație;
- Anul fabricației;
- Temperatura de operare permisă/de calcul;
- Presiunea de operare permisă/de calcul;
- Presiunea de testare;

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- Tag number according to the defined numbering system.

- Certificare CE – conform cerintelor;
- Codificare conform sistemului de numerotare definit.

11. SPARE PARTS / PIESE DE REZERVA

The Supplier has to provide with the offer following spare:

- spare parts for testing operation and commissioning;
- spare parts for two years of operation during the warranty period;
- special tools and equipment maintenance and testing.

Also, the supplier must include in the offer a complete list of supplies and spare parts during the lifetime of the skid (25 years).

Conditions for spare parts

All the spare parts will comply with the same specifications as the original equipment and be fully interchangeable with original parts, without any modification to the assembly.

They will be properly marked with the reference numbers and will be protected to avoid damages during transport and storage.

Metal plates will be attached of all spare parts with complete data identifying the name of the manufacturer, serial number and features.

All spare parts will be checked before delivery. Corrosion protection will be guaranteed for 3 years from delivery.

Electric equipment will be packed in polyethylene bags or similar that will be contain desiccants.

All spare parts will be packaged separately to be taken immediately in the customer

FURNIZORUL trebuie sa includa in oferta sa urmatoarele elemente:

- piesele de schimb pentru teste si punerea in functiune;
- piesele de schimb pentru 2 ani de functionare in perioada de garantie;
- scule speciale si echipamente de intretinere si testare.

De asemenea, FURNIZORUL trebuie sa includa in oferta si lista completa a consumabilelor si pieselor de schimb pe intreaga durata de viata a instalatiei (de 25 de ani).

Conditii pentru piesele de rezerva

Toate piesele de rezerva vor corespunde acelorasi specificatii si verificari ca si aparatura originala si vor fi complet interschimbabile cu piesele originale, fara nici o modificare la montaj.

Ele vor fi corect marcate cu numere de referinta si vor fi protejate pentru evitarea deteriorarilor la transport si depozitare.

Tuturor pieselor de rezerva li se vor atasa placute metalice nedeformabile cu date complete de identificare ca: numele fabricantului, numarul seriei si caracteristici.

Toate piesele de rezerva vor fi verificate inaintea livrarii. Protectia la coroziune va fi garantata pentru 3 ani de la livrare.

Aparatura electrica va fi ambalata in pungi de polietilena sau similare in care se vor introduce desicanti.

Toate piesele de rezerva vor fi impachetate separat pentru a fi preluate imediat in magazia clientului la livrare, verificate de client si reimpachetate.

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warehouse upon delivery, client checked and repackaged.

12. VENDOR DRAWINGS AND DATA REQUIREMENTS / DATE SI DESENE CERUTE VANZATORULUI

The supplier must deliver, all the documentation and drawings needed for installation, commissioning, performance and maintenance of Pumping Skid.

The supplier shall provide as a minimum the following documentation:

- General arrangement and detail drawings including weights (empty, operating, test);
- Loads on foundation;
- Description of the supply;
- Philosophy, functionality and operating principle;
- Block flow diagram;
- Piping & Instrumentation Diagram P&ID;
- Equipment list;
- Equipment data sheets (pumps, filters, etc);
- Instrumentation list;
- I/O list for monitoring system;
- Complete instrumentation data sheets;
- Main operating parameters for each instrument, separately;
- Selection criteria for the proposed instrumentation;
- Installation details for all instruments;
- Lists of materials necessary for installing instrumentation;
- Measuring loop diagrams, control and signaling;
- Electrical wiring diagrams for the Monitoring System;

Furnizorul trebuie să livreze, toată documentația și desenele necesare pentru montarea, punerea în funcțiune, functionarea și întreținerea Skid-ului de pompare.

Furnizorul trebuie să furnizeze cel puțin următoarea documentație:

- Plan general si desene de detaliu incluzand greutatea (gol, in operare, in teste);
- Incarcarile in fundatii;
- Descrierea echipamentelor furnizate;
- Filosofie, funcționalitate și principiu de funcționare;
- Diagrama flux;
- P&ID schema de conducte si instrumentatie;
- Lista echipamente;
- Foi de date echipamente (pompe, filtre, etc.);
- Lista de instrumente;
- Lista I/O pentru sistemul de monitorizare;
- Foi de date complete de instrumente;
- Principalii parametri de funcționare pentru fiecare instrument, separat;
- Criterii de selecție pentru instrumentația propusă;
- Detalii de instalare pentru toate instrumentele;
- Liste de materiale necesare instalarii instrumentatiei;
- Scheme bucle de masurare, control si semnalizare;
- Scheme electrice pentru Sistemul de Monitorizare;

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- Consumption of utilities;
- List of cables and routes;
- The list of utility consumption;
- Spare parts list;
- Installation and operation manuals;
- As built documentation.

The vendor will submit a list with deliverables that are necessary for package integration. These shall be issued within a reasonable date form P.O.

This list shall consist of minimum, but not be limited to, the following:

- layout plan;
- general assembly drawing;
- electrical diagrams;
- list of electrical consumers;
- list of instrumentation signals;
- data for foundation design;
- anchoring details.

- Consum de utilitati;
- Lista cablurilor și traseelor;
- Lista consumurilor de utilitati
- Lista de piese de schimb;
- Manuale de instalare si utilizare;
- Documentatia As-built.

Furnizorul va trimite o listă cu livrabilele care sunt necesare pentru integrarea pachetului. Acestea vor fi emise într-o dată rezonabilă, formularul P.O.

Aceasta lista va cuprinde minim, dar nu va fi limitat la urmatoarele:

- plan amplasare;
- desen ansamblu general;
- scheme electrice;
- lista consumatori electrici;
- lista semnale instrumentatie;
- date pentru proiectarea fundatiei;
- detalii pentru ancorare.

13. TRAINING COURSE / CURS DE INSTRUIRE

Training courses for the control system and instrumentation, operation and maintenance of the unit and other necessary courses in order to accommodate all shifts with new equipment shall be done by the supplier. The courses shall be performed prior to handing over the skid to operation.

Furnizorul va organiza cursuri de instruire pentru sistemul de comanda si instrumentatie, operarea si intretinerea modulului si alte cursuri necesare in vederea familiarizarii angajatilor din toate schimburile cu echipamentele noi. Cursurile se vor tine inainte de predarea instalatiei in vederea operarii.

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1 CONSTRUCTION (to be completed by purchaser and manufacturer)							
2 Pump Type:		Connections:		ND (in)	Class(PN)	Facing	Position
3 ☐ Internal Gear ☐ Twin-Screw ☐ Vane		As per EN 1092-1		Suction	Hold	PN16	type B1
4 ☐ External Gear ☐ Three-Screw ☒ Progressing Cavity				Discharge	Hold	PN63	type B1
5 Gear Type:				Gland Flush			
6 ☐ Spur ☐ Helical ☐ Other				Drains			
7 Casing:				Vents			
8 ☒ Max. Allowable Pressure 40 barg/ @ 20 °C				Jacket			
9 ☐ Max. Allowable Pressure barg		Mechanical Seals: Single mechanical seal acc. EN ISO 21049					
10 ☐ Steam Jacket Pressure barg/ @ °C				☒ Mfr. and Model Type: cartridge Size:			
11 Rotor Mount: ☒ Between Bearings ☐ Overhung				☒ Mfr. sealing Code Type: Size:			
12 Bearing Type: ☒ Radial ☒ Thrust		Lubrication Type ☐ Constant Level Oilers					
13 Lubrication Type: ☐ Pumpage ☐ CLO		☐ Pumping Fluid ☐ Ring Oil ☐ Oil Mist					
14 ☐ Packing ☐ Lantern Ring		☐ External ☐ Oil Flood ☐ Grease					
15 ☐ Manufacturer and Type ☐ No. of Rings		Coupling Type: ☒ Manufacturer and Model See Note 8					
16 MATERIAL (to be completed by manufacturer)				☒ Sleeve(s) / Gland(s) FKM			
17 ☒ Casing Carbon steel		☒ Bearing Housing Grey cast					
18 ☒ Stator / Stator Coating EPDM / 110,70 Durometru		☒ Protective Coating FPM even wall design					
19 ☒ Coupling Rod 1.4021 stainless steel		☒ Special Material Tests					
20 ☒ Rotor(s) C 45 carbon steel		☒ Low Ambient Temperature Material Test					
21 ☒ Rotor Surface Coating ductile hardcoating		☐ Baseplate					
22 ☒ Shaft 1.4021 stainless steel		☐ Coupling					
23 DRIVE MECHANISM (to be completed by manufacturer)							
24 ☐ Direct-Coupled ☐ V-Belt		☐ Motor Induction Motor					
25 ☒ Gear (ratio i= 7.158) ☐ Coupling Manufacturer		☐ Manufacturer					
26 BASEPLATE		☐ Type					
27 ☒ By Pump Manufacturer ☐ Suitable for Epoxy Grout		☐ Frame No.					
28 ☐ Extended For Pump And Motor		☐ Constant Speed ☒ Variable Speed					
29 ☐ Subsole Plates by Pump Manufacturer		☐ kW VTA rpm VTA					
30 ☒ Drain ☒ Drain-Pan		☒ Volts 400 V Phase 3 PH					
31 PREPARATION FOR SHIPMENT		☒ Hertz 50 Hz Service Factor 9					
32 ☐ Domestic ☐ Export ☐ Export Boxing Req'd.		☒ Enclosure ATEX ☒ IP Code min.IP55					
33 ☒ Outdoor Storage more than 3 months		☐ Others (see separate data sheets)					
34 QA INSPECTIONS AND TESTS							
35 ☒ Compliance with Inspectors Check List				Req'd Wit OBS			
36 ☒ Certification of Materials (3)				Hydrostatic @ bar ☒ ☐ ☒			
37 ☒ Final Assembly Clearances				Mechanical Run ☒ ☒ ☐			
38 ☐ Surface and Subsurface Examinations				Performance ☒ ☒ ☐			
39 ☐ Radiography				NPSH ☒ ☒ ☐			
40 ☐ Ultrasonic				WEIGHTS Net Maintenance Shipping			
41 ☐ Magnetic Particle				Pump kg			
42 ☐ Liquid Penetrant				Base kg			
43 ☐ Cleanliness Prior to Final Assembly				Gear kg			
44 ☒ Hardness of Parts, Welds & Heat Affected Zones				Driver kg			
45 ☐ Furnish Procedures for Optional Tests				Total kg			
46 OTHER PURCHASER REQUIREMENTS							
47 Nameplate Units ☒ SI		Piping for Cooling / Heating Furnished by:					
48 ☐ Relief Valves by Pump ☐ Internal ☒ External		☐ Pump Vendor ☐ Others					
49 Piping for Seal Flush Furnished by:		☒ Provide Technical Data Manual					
50 ☒ Pump Vendor ☐ Others		☒ Noise Level ☒ max85 dB(A)@1m ☒ Project Standard					

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1	PUMP DIMENSIONAL SKETCH				
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1	NOTES				
2	(1) CE marking is mandatory for all equipments. Operating manuals should be in English and Romanian language (for pump and motor). Marking and Declaration of conformity for assembly in respect of directive 2014/34 and IEC TS 60079-46. ATEX Certification required for entire equipment				
3	(2) Material certification according EN 10204 3.1 required for part under pressure.				
4	(3) Design lifetime of the pumps will be 25 years.				
5	(4) A safety margin of 20% will be required between maximum operating pressure and design pressure.				
6	(5) Base plate common for pump and motor will be provided with lifting lugs and earthing clips.				
7	(6) Earthing connection for pump motor and guards.				
8	(7) Coupling will be metallic flexible element type, nonlubricated, with spacer element that allows sufficient length for maintenance works. Belts, coupling and coupling guard shall be of non-sparking type.				
9	(8) Bearing shall be designed for the maximum load for a lifetime of min. 40 000h. Bearings will be interchangeable sizes and will be placed in a separate oil lubed housing.				
10	(9) Coupling roads shall be with universal articulated joints pin type, hermetically sealed, grease lubricated.				
11	(10) Hydrostatic test pressure for each casing components should be at least 1.5 times MAWP.				
12	(11) The motor rated load will be selected in order to assure a 10% overcapacity of the pump operating to the pressure of the safety valve relife set point.				
13	(12) A proposal for the maintenance contract services, spare part included and for spare parts used in maintenance activity, has to be included in the offer.				
14	(13) Fixing bolts diameter and loads (dynamic and static) shall be provided by Vendor . Fixing bolts shall be supplied by Constructor .				
15	(14) Design Temperature : Max 60 °C and Min: -29 °C				
16	(15) Outdoor mounted, directly into the sunlight. The motors starting type: VSD; Motor duty type: S9; The motors cable glands has to be metallic type; The supply network has the following characteristics: IT system type (3Ph); Motor has to be in accordance with IEC 60034 and EN 60079; Electrical motor accessories: anticondensation heater 220V, 50Hz, connected in separate terminal box. Motor shall have PTC's for winding temperature and for PTC's/PT's bearing temperature.				
17	(16) VTA = Vendor to Advise.				
18	(17) 5. Pumps shall be winterized (electrical trace heating shall be provided by vendor) considering minimum environmental temperature. For trace heating supply 230 VAC is available on site.				
19	(18) Gearbox shall be without external cooling				
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		Project Title/ Titlu Proiect	OARJA CENTRAL PRODUCTION FACILITY OPTIMIZATION		
		Doc. Title / Titlu Doc.:	OIL EXPORT PUMPS SKID - CONPET / SKID DE POMPARE TITEI - CONPET		
		Doc. No. / Doc. nr. :	TFP30-D-TUV-R-SA-010	Rev. 02	Page 32 of 32

15. ATTACHEMENT 2 – VENDOR BATTERY LIMITS / ANEXA 2 – LIMITA SCOPULUI FURNIZORULUI

