PETROVIETNAM PVFCCo	**TỔNG CÔNG TY PHÂN BÓN VÀ HÓA CHẤT DẦU KHÍ - CTCP**

DỰ ÁN	**ĐẦU TƯ BỒN ACID H3PO4 TẠI XƯỞNG NPK**
CHỦ ĐẦU TƯ	**TỔNG CÔNG TY PHÂN BÓN VÀ HÓA CHẤT DẦU KHÍ – CTCP (PVFCCo)**
ĐẠI DIỆN CĐT	**CHI NHÁNH QUẢN LÝ VÀ PHÁT TRIỂN DỰ ÁN (CN QLPTDA)**
NHÀ THẦU	**TỔNG CÔNG TY CỔ PHẦN DỊCH VỤ KỸ THUẬT DẦU KHÍ VIỆT NAM (PTSC)**
GIAI ĐOẠN	**THIẾT KẾ, CUNG CẤP VẬT TƯ THIẾT BỊ VÀ THI CÔNG XÂY DỰNG CÔNG TRÌNH (EPC) BỒN ACID H3PO4 TẠI XƯỞNG NPK**

TECHNICAL REQUISITION DOCUMENT POWER CABLE AND CONTROL CABLE

ĐẠI DIỆN CHỦ ĐẦU TƯ

PTSC

B	24/02/2026	Ban Hành Cho Xem Xét	Lê Thành Long	Trần Văn Đức	Trần Đình Hùng	Nguyễn Khắc Dũng
A	11/02/2026	Ban Hành Cho Xem Xét	Lê Thành Long	Trần Văn Đức	Trần Đình Hùng	Nguyễn Khắc Dũng
LXB	**Ngày XB**	**Mô tả**	**Thực Hiện**	**Chủ Trì Thiết Kế**	**Chủ Nhiệm Thiết Kế**	**Giám Đốc Dự Án**

TỔNG CÔNG TY CỔ PHẦN DỊCH VỤ KỸ THUẬT DẦU KHÍ VIỆT NAM (PTSC)	**Số Tài Liệu:** H3PO4-PTSC-EL-TRD-0002
	Số trang: 13 (Bao gồm cả trang này)

LỊCH SỬ PHIÊN BẢN

Phiên bản	Trang	Ngày	Mô tả	Ghi chú
A	All	11/02/2026	Ban hành cho xem xét	
B	All	24/02/2026	Ban hành cho xem xét	

TABLE OF CONTENT

1. PURPOSE

1.1. Project overview

This document is to specify minimum requirements for Power Cable And Control Cable which shall be used for H3PO4 ACID STORAGE TANK Project.

2. LANGUAGE AND UNITS

2.1. Language

All documents and drawings to be submitted shall be lettered in English language.

2.2. Units of measurement

Glossary	Units
Temperature	^{0}C (Degree)
Pressure	kPa (psi for flange rating) mH2O/ Barg
Flow Rate	Kg/Hr, MT/Hr, Nm3/Hr, m3/Hr (bbl/d), MMSCMD
Velocity	m/sec
Length	mm (inch for nominal pipe size)
Weight	Kg, Ton (metric ton)
Power	W (KW)
Density	Kg/m3
Electrical Voltage	V
Electrical Current	A
Revolution	RPM
Energy	KJ, MJ
Frequency	Hz

3. SERVICE CONDITION

- Location: Phu My Industrial Zone, Ho Chi Minh, Vietnam
- Altitude: 4 m above MSL
- Ambient Temperature – Maximum: 36.7 °C
- Ambient Temperature – Minimum: 18.1 °C
- Design Ambient Temperature (For Electrical Equipment): 40 °C
- Fault Level: 98% at 30 °C (Design wet bulb temperature)
- Rainfall (Max.): 12 mm per hour
- Seismic Grade: VI (MSK-64) as per TCVN 9386-1:2012
- Soil Resistivity 12 Ohm-meter
- Thermal Resistivity of Soil: 0.93 Deg. K·m/Watt
- Presence of Corrosive Atmosphere: Yes, by the presence of NH_3, NOx, CO_2, river water vapour (saline) and urea dust
- Troplicalizing Required: Yes

Area Classification:

Area classified: H3PO4

4. DEFINITIONS AND ABBREVIATIONS

4.1. Definitions

The following definitions and abbreviations are used in this document:

PROJECT	Investment Axit Photphoric storage tank at NPK Plant
OWNER	Petrovietnam Fertilizer and Chemicals Corporation (PVFCCo)
CONTRACTOR/ PURCHASER	Petrovietnam Technical Service Corporation (PTSC)
VENDOR	Party responsible for manufacturing and/or packaging of equipment

4.2. Abbreviations

The following abbreviations are used in this document:

AC	Alternating Current
ACB	Air Circuit Breaker
CB	Circuit Breaker
CBCT	Core Balance Current Transformer
CT	Current Transformer
DC	Direct Current
DCS	Distributed Control System
DI	Digital Input
DO	Digital Output
EMC	Electro Magnetic Compatibility
FAT	Factory Acceptance Test
FEED	Front End Engineering Design
Hz	Hertz
IP	Ingress Protection
IEC	International Electro-technical Commission
ITP	Inspection and Test Plan

kA	Kilo Amps
kVA	Kilo Volt Ampere
LCS	Local Control Station
LV	Low Voltage (voltages below 1000 V)
MCB	Miniature Circuit Breaker
MCCB	Moulded Case Circuit Breaker
NC	Normally Closed
NCT	Neutral Current Transformer
NO	Normally Open
RCU	Remote Control Unit
SLD	Single Line Diagram
TCP/IP	Transmission Control Protocol / Internet Protocol
UPS	Uninterruptible Power Supply

5. ITEMS AND QUANTITIES

VENDOR shall furnish the following Power Cable and Control Cable Package including accessories, spare parts, special tools, etc., as per "MTO" (Appendix No.4).

6. SCOPE OF SUPPLY

6.1. Scope of Supply

The following scope of supply covers the minimum technical requirements for the supply of all Power Cable & Control Cable conforming to all attached specifications, datasheet documents for service on the H3PO4 ACITD STORAGE TANK Project.

The scope of supply including equipment, services, and documentation as listed here is not intended to be exhaustive or complete and shall not be deemed to limit the VENDOR scope.

The following covers the minimum scope of supply for all Power Cable and Control Cable. The quantity of all Power Cable and Control Cable to be supplied shall be as per documents listed below:

No.	Q'Ty	Description
1	1 lot	Material Accordance to: 1. MTO for Power Cable And Control Cable (Refer to Appendix 4) 2. MTO for Instrument Cable Cable (Refer to Appendix 5)
2	1 lot	Inspection, Testing and Certification: Complete inspection, QA/QC and testing requirements including test defined in the specification along with all supporting documentation
3	1 lot	Complete Vendor data and final documentation in accordance with equipment specification and VDRL matrix (refer to Appendix 1 of this document).
4	1 lot	Cable test certificates for individual lengths, Type test certificate
5	1 lot	Long term preservation and preparation for shipment and packing
6	1 lot	Transportation and other related cost to transport the Goods shall be provided
7	1 lot	Certificate of Origin (CO) issued by Chamber of Commerce of Export/Manufacturing Country

6.2. Out of Scope

The following are excluded from VENDOR's scope of work:

- Installation.

7. CONFLICTING REQUIREMENTS

Vendor shall notify Purchaser of any conflicts between this TRD, specifications, the related data sheets, the Codes and Standards and any other specifications noted herein. Resolutions and/or interpretation precedence shall be obtained from Purchaser in writing before proceeding with the design/manufacture.

8. DEVIATION LIST

Vendor's quotation shall be in full conformity with Purchaser's requirements. Unless exceptions, deviations or alternatives are clearly defined and listed on the attached Purchaser's form "Deviation List" and submitted with Vendor's quotation, the requirements and conditions of this Requisition shall be deemed to be accepted by the Vendor

9. GENERAL REQUIREMENTS

9.1. General

The Package shall be strictly in accordance with data sheets, drawings, specifications, codes, and standards specified.

Compliance by the VENDOR with the provision of this specification does not relieve him of his responsibility to furnish the package/ material and accessories of a proper design to meet the specified duty and / or local codes governing health and safety.

All applicable documents mentioned below are attached with the request for inquiry. However, if the VENDOR is not in possession of any of the listed or referenced Purchaser documents, it shall be VENDOR's sole responsibility to obtain them from the Purchaser. Otherwise, it shall be assumed that the VENDOR has received, read and understood the total contents of the documents.

All materials and parts shall be new, unused and free from defects and imperfections that would adversely affect the life or performance of the system.

VENDOR data shall include detailed design drawings and updated data sheets of each material and appurtenances. Detail design drawings shall be fully dimensioned and complete with Bill of Materials.

No fabrication would commence until PURCHASER has approved the drawings.

PURCHASER's approval on drawings does not relieve VENDOR of compliance with applicable codes, specifications, safety design, or meeting the requirements of governmental agencies.

Any work and documentation related to facilitating design appraisal approvals and inspection from PURCHASER appointed Certification Authority (CA) and QA/QC Inspector (TPI) shall also be included in Vendor 's scope of supply

9.2. Design Life, Availability and Reliability

The design life of the facility and all associated equipment, components and systems is minimum 20 years.

All components which for practical, safety or cost-efficiency reasons are unable to meet the required design life shall be identified as soon as possible. Their expected service life shall be informed to Purchaser and provision made in the system design for maintenance to extend component life or routine change-out.

9.3. Protective Coating and Painting

Surface preparation and coating of all exposed metal parts shall be in accordance with the "Specification for Painting and Coating".

9.4. Preparation for Shipment

Equipment shall be prepared for export shipment and shall be created to provide maximum protection during shipment and extended outdoor storage.

Any equipment liable to be damaged during shipment shall be disassembled, packed separately, shipped with the unit and reassembled onsite under the supervision of VENDOR's commissioning/start-up technician

Each crate shall be clearly identified in accordance with the customer's specification. As a minimum the crate shall be marked with the Purchase Order number, the item number, the shipping mass and the delivery address.

Flanged process connections shall be protected by steel cover plates bolted in place with at least 4 bolts then sealed with tape. All nozzles and branches shall be protected against damage during transportation and erection.

The equipment shall be suitably preserved to maintain in good condition throughout the phases of storage until ready to be operated.

Threaded nozzle connections shall be protected with threaded plugs. However, telltale holes in reinforcing pads shall be protected with non-hardening plastic sealant or packed with grease.

Exposed machined surfaces, including threads extending beyond the nuts, shall be protected with an easily removable rust-preventive coating.

All equipment shall be suitably protected for shipment and securely anchored during transit. Separate or loose parts shall be completely boxed with identification tag.

Tools and spare parts shall be packed in metal boxes suitable for long term storage. The boxes shall be galvanized or coated in accordance with Project requirement.

9.5. Guarantee and Warranty

The VENDOR shall have final and total responsibility for the design and performance of all material supplied under this specification.

The VENDOR shall replace and install without cost to the PURCHASER any materials, supplies which fails under design conditions due to defects in material or workmanship if the defect is observed and/or such failure occurs within the guarantee/warranty period. Acceptance of this order will signify acceptance of all conditions of this guarantee.

The guarantee period starting from delivery of the Goods and ending after the first twenty-four (24) months of in-service use of the Goods (such period not to exceed 36 (thirty-six) months from the date of delivery of the Goods to Buyer).

9.6. Spare part

9.6.1. Start-up and Commissioning Spares

The VENDOR shall include, as part of his bid, a detailed price list of start-up and commissioning spares which shall be supplied as part of the original purchase package.

9.6.2. Two Year Spares

The VENDOR shall include, as part of his bid, a detailed list of recommended spare parts for two years continuous operation. These spares shall be costed for separate purchase.

10. INSPECTION AND TEST

Inspection and tests shall be made by the VENDOR in accordance with:

[X] Test & Inspection should be carried out according to the applicable project documents and applicable codes and standards

[X] Maker's standard plan & procedure as approved by PURCHASER

[X] Local regulation, if any

The Company and/or Purchaser inspector shall hold a right to be present at any manufacturing stage of the equipment and/or materials.

The Vendor shall state the inspection method, acceptance criteria and the inspection items with "Witness" or "Not witness" in his inspection and test procedure.

11. COORDINATION MEETING

After the purchase order is placed, VENDOR shall, upon receipt of PURCHASER's notice, send a sufficient number of qualified personnel at VENDOR's cost to hold the meetings according to the following schedule:

[x] Kick-off meeting	Two (2) week(s) after the order	[ ] Vendor office	[x] Purchaser's office
[x] Coordination meeting	* Note 1 month(s) after the order	[ ] Vendor office	[ ] Purchaser's office
[ ] Design review meeting	_____ month(s) after the order	[ ] Vendor office	[ ] Purchaser's office
[x] Pre-inspection meeting	*01* month(s) before Fab. start	[ ] Vendor office	[x] Purchaser's office

** Note 1 : The time period for the same to be agreed at kick-off meeting*

12. APPLICABLE DOCUMENT

Documents listed below shall make an integral part of this technical requisition:

Document No.	Document Title	Remark
H3PO4-PTSC-EL-SPC-0003	Đặc tính kỹ thuật Bulk Material	
H3PO4-PTSC-EL-DSL-0001	Sơ đồ nguyên lý hệ thống điện	
H3PO4-PTSC-EL-DAL-0002	Bản vẽ bố trí chiếu sáng	
H3PO4-PTSC-EL-LST-0001	Danh mục phụ tải điện	
H3PO4-PTSC-EL-LST-0002	Danh mục cáp điện	
H3PO4-PTSC-IN-LST-0003	Danh Mục Cáp Điều Khiển Và Báo Cháy	

13. VENDOR DATA REQUIREMENT

The VENDOR shall submit the completed documents and drawings, in accordance with the "Vendor Data Requirements" in time.

As minimum, VENDOR technical proposal shall include documentations as specified in "With Bid" column of Appendix No. 1.

Vendor Data Requirements shall be referred to Appendix No. 1.

14. APPENDICES

Appendix No. 1: Vendor Data Requirement List (06 pages)
Appendix No. 2: Purchaser Form (08 pages)
Appendix No. 3: Typical Inspection and Test Plan (02 pages)
Appendix No. 4: MTO for Power Cable And Control Cable (02 pages)
Appendix No. 5: MTO for Instrument Cable (02 pages)

APPENDIX No.1

VENDOR DATA REQUIREMENT LIST

(06 pages, including this page)

VENDOR DATA REQUIREMENT LIST

Legend:

1* : E

E : Electronic file

C : Copy

PO + XXD: XX days after PO date

IFI: Issued for Information

*2 : 1OR + 6C + E + 2CD

OR : Original

CD : CD-ROM/ USB Thumb Drive

DE – YYD: YY days before delivery date

IFA: Issued for Approval

IFC: Issued for Construction

Item no.	VP Code	Description	With Bid (Y/N)	First Issue			Final Issue	
				Issue Date	Purp.	Q'ty	Purp.	Q'ty
	1	**COMMERCIAL/CONTRACTUAL**						
1	C01	VENDOR Data Index & Schedule	Y	PO + 14D	IFA	1*	IFC	*2
2	C02	Engineering, Procurement, Manufacturing and Test Schedule		PO + 14D	IFA	1*	IFC	*2
3	C03	Sub Contract Work Proposal						
4	C04	Delivery, Handling and Packing Proposals		PO + 14D	IFI	1*	IFI	*2
5	C05	Exception and Non-Conformity Form						
6	C06	VENDOR's Sub-Orders (Un-Priced copy)						
7	C07	Warranty/Guarantee Confirmation						
8	C08	VENDOR/SUB-VENDOR List		PO + 28D	IFI	1*	IFI	*2
9	C09	Project Management Organisation						
10	C10	Progress Reports (Weekly and Monthly)		Weekly	IFI	1*	IFI	*2
11	C11	Proven Design and Manufacturing Experience List	Y	PO + 14D	IFI	1*	IFI	*2
12	C12	Schedule of Pricing						
	2	**PROCESS/MECHNICAL/PIPING/ STRUCTURAL**						
13	M01	Foundation Load and Anchor Bolt Location						
14	M02	Drive Assembly Details						
15	M03	Equipment Design Calculations including Transportation						
16	M04	Structural Design Calculations						
17	M05	Pipe Stress Calculations						
18	M06	Process Flow Diagrams including Heat and Mass Balance						
19	M07	Piping and Instrument Diagrams						
20	M08	Process Sizing Calculations						
21	M09	Exchanger Thermal Rating Calculations						
22	M10	Hydraulic Calculations						
23	M11	Thermal Growth Calculations						
24	M12	Utility Calculations						
25	M13	Flare/Relief System Calculations						
26	M14	Flare Dispersion Calculations						
27	M15	Reliability/Availability Data and Calculations						
28	M16	Lube and Seal Oil System Sizing Calculations						
29	M17	Anti Surge Valve Sizing Calculations						
30	M18	Line List						
31	M19	Equipment Data Sheet including specialty items						
32	M20	Prime Mover Data Sheets (Motor/ Diesel engine/ Gas Engine/ Turbine)						
33	M21	Weight Datasheet						
34	M22	Noise Level Data Sheets						

Item no.	VP Code	Description	With Bid (Y/N)	First Issue			Final Issue	
				Issue Date	Purp.	Q'ty	Purp.	Q'ty
35	M23	General Arrangement Drawings						
36	M24	Detail / Assembly / Fabrication Drawings						
37	M25	Cross Section Drawing / Exploded View Drawings						
38	M26	Internals Drawings / Miscellaneous Drawings						
39	M27	Mechanical Seal Drawings						
40	M28	Shaft Alignment Drawings						
41	M29	Bill of Material						
42	M30	Centre of Gravity Sketch						
43	M31	Installation & Dismantling Drawings / Procedures (As Applicable)						
44	M32	Lifting / Transportation Drawings						
45	M33	Name Plate Drawings						
46	M34	HVAC Schematic and Flow Diagrams						
47	M35	Skid/Module GA and Detail Drawings						
48	M36	Lifting Lug Details/ Calculations						
49	M37	Allowable Nozzle Load Calculations						
50	M38	Weight and Centre of Gravity Calculations						
51	M39	Lifting Equipment Calculations						
52	M40	Lateral Critical Speed Calculations						
53	M41	Torsional Critical Speed Calculations						
54	M42	Bearing Life Calculations						
55	M43	Thrust Bearing sizing Calculations						
56	M44	Pulsation Dampener Design Calculations						
57	M45	Rotor/Shaft system Unbalanced Response Analysis						
58	M46	Coupling Selection Calculations						
59	M47	Dynamic Characteristics: Lateral & Torsional Analysis						
60	M48	Foundation Load Calculations						
61	M49	HVAC Calculations						
62	M50	Vibration Calculations						
63	M51	Miscellaneous Calculations						
64	M52	Skid Piping GA Drawings						
65	M53	Pipe Work Support Details						
66	M54	Valve List						
67	M55	Piping Isometrics						
68	M56	Non-Actuated Valve Torque Calculations						
69	M57	Tie-in Schedule						
70	M58	Pulsation Analysis						
71	M59	Relief Valves Calculations and Sizing						
72	M60	Lifting Lug / Trunnion Calculations						
73	M61	Structural Skid / Support Calculations						
74	M62	Tank Tress Calculation						
	3	**INSTRUMENT/ELECTRICAL**						
75	J01	Package Electrical Termination Drawings						
76	J02	Panel Layout and Details						
77	J03	JB/Panel Wiring Diagrams						
78	J04	Instrument / Fire and Gas Location Plans / Cable Layouts						
79	J05	Instrument / Fire and Gas Installation Details / Hook-ups						
80	J06	Loop Diagrams						
81	J07	Cause & Effect Charts						
82	J08	Alarm / Trip Set Point List						
83	J09	Electrical Wiring Diagrams						

Item no.	VP Code	Description	With Bid (Y/N)	First Issue			Final Issue	
				Issue Date	Purp.	Q'ty	Purp.	Q'ty
84	J10	Electrical Schematic Diagrams						
85	J11	Electrical Single Line Diagrams						
86	J12	Sequence and Logic Diagrams, Cause and Effect Diagrams						
87	J13	Instrument/Electrical [ISA] Data Sheets						
88	J14	Instrument schematics and control diagram						
89	J15	Functional Design Specifications						
90	J16	Cable block diagram, SR Data link Address & Screen Graphics						
91	J17	Instrument Calculations including Safety Valves, Control Valves, Instrument Calculations including Safety Valves, Control Valves,						
92	J18	Instrument Index						
93	J19	I/O Schedules						
94	J20	VDU Screen Display Graphics						
95	J21	Control and Shutdown Philosophy						
96	J22	Cable schedule						
97	J23	Junction Box - Specification and Drawings						
98	J24	Electronic Cable detail						
99	J25	Panel Test Procedure						
100	J26	Type Test Procedure						
101	J27	Tie-in Schedule						
102	J28	Shutdown and Control Function Charts, Safe Charts, logic diagrams						
103	J29	Instrument/Fire & Gas/ Electrical Data Sheets		PO + 14D	IFA	1*	IFC	*2
104	J30	Control system architecture						
105	J31	Serial Link Mapping List						
106	J32	Earthing Diagram						
107	J33	Load Calculation						
108	J34	Junction box schedule						
109	J35	Reliability & Availability Data		PO + 14D	IFA	1*	IFC	*2
	4	**GENERAL**						
110	G01	Descriptive Literature and Catalogue Information	Y	PO + 14D	IFA	1*	IFC	*2
111	G02	Sub Vendor Data Sheets / Manuals		PO + 14D	IFA	1*	IFC	*2
112	G03	Recommended Spare Parts For 2 Year Operation, Priced						
113	G04	Recommended Spare parts for Start-up & Commissioning, Priced						
114	G05	List of Special Tools, where applicable						
115	G06	Utility Requirements – Power / Air / Water / Other						
116	G07	Consumables list including lubrication						
117	G08	Loading, Transport and Unloading Details		PO + 28D	IFA	1*	IFC	*2
118	G09	Preservation and Storage Procedure		PO + 28D	IFA	1*	IFC	*2
119	G10	Hazardous Area Dossier						
120	G11	Hardware Standard Software Documentation						
121	G12	Material Safety Data Sheet						
122	G13	Packing List		DE - 14D	IFI	1*	IFI	*2
123	G14	Not used						
124	G15	Preparation for Shipment Procedure		DE - 14D	IFI	1*	IFI	*2
	5	**PERFORMANCE**						
125	P01	Performance and Test Procedure		PO+120D	IFA	1*	IFC	*2

Item no.	VP Code	Description	With Bid (Y/N)	First Issue			Final Issue	
				Issue Date	Purp.	Q'ty	Purp.	Q'ty
126	P02	Performance Curves and Data (Pump, Compressor, Gas Turbine, Motor, Engine, Fan, Vessel Internals, etc.)						
127	P03	Speed/Torque Curves, Gas Turbine/Gear/Generator vs. Starting Motor						
128	P04	Trial Assembly Report						
129	P05	Performance Test Reports		PO+160D	IFA	1*	IFC	*2
130	P06	Noise Reports						
131	P07	FAT Reports		PO+160D	IFA	1*	IFC	*2
132	P08	Commissioning and Site Acceptance Test Results						
133	P09	Vibration Reports						
134	P10	Acoustic Analysis						
135	P11	Crane Failure Mode Analysis						
136	P12	Heat Emission Calculations						
137	P13	Battery Charge/Discharge Curves						
138	P14	Electrical Relay Characteristics						
139	P15	Pulsation Study						
	6	**QA/CERTIFICATION/REPORT**						
140	Q01	QA Accreditation Certification		PO+56D	IFA	1*	IFC	*2
141	Q02	Contract Quality Plan/ Project Quality Plan		PO+56D	IFA	1*	IFC	*2
142	Q03	Welding Procedures & Qualification Test Reports						
143	Q04	Inspection and Test Plan		PO + 28D	IFA	1*	IFC	*2
144	Q05	Inspection and Test Reports		PO+160D	IFA	1*	IFC	*2
145	Q06	Calibration Procedures & Results						
146	Q07	Hydro Test/Pneumatic Test Procedures						
147	Q08	Hydro Test/Pneumatic Test Reports						
148	Q09	Material Mil Test Certification		PO + 28D	IFA	1*	IFC	*2
149	Q10	Electrical Type Test Certificates	Y	PO+56D	IFA	1*	IFC	*2
150	Q11	Approval cert. of Relevant Authorities (for Flame Retardant cable and Fire-Resistant cable)		DE-14D	IFA	1*	IFC	2*
151	Q12	Statement of Code Compliance						
152	Q13	Hazardous Area Certification, IP Certification		PO+56D	IFA	1*	IFC	*2
153	Q14	Heat Treatment Records, where applicable						
154	Q15	Charpy Impact Tests, where applicable						
155	Q16	Vendor Concession (Deviation) Request						
156	Q17	Surface Preparation and Paint Procedure and Report						
157	Q18	NDE Procedure & NDE Location Plan						
158	Q19	Manufacturing Procedures including Heat Treatment						
159	Q20	Pre-Commissioning/ Commissioning/Site Acceptance Test Procedure						
160	Q21	Factory Acceptance Test Procedure		PO+56D	IFA	1*	IFC	*2
161	Q22	Weighing Procedure						
162	Q23	Post Weld Heat Treatment Procedures						
163	Q24	Non-Conformance Report (NCR) Procedure						
164	Q25	Erection & Installation Procedure						
165	Q26	Weld Location Plans						
166	Q27	Repair Procedures						
167	Q28	Weight Certificate (equipment > 50 kg)						
168	Q29	Lifting Equipment Certification						
169	Q30	Dimensional Control Report						
170	Q31	Welder Performance Qualification Records/Certificates						
171	Q32	NDE Operator Qualifications & Certificates						

Item no.	VP Code	Description	With Bid (Y/N)	First Issue			Final Issue	
				Issue Date	Purp.	Q'ty	Purp.	Q'ty
172	Q33	Production Test Results (Including welding)						
173	Q34	NDE/NDT Reports						
174	Q35	Material Traceability Records (Location Drawing)						
175	Q36	Certificate of Compliance	Y	DE-14D	IFA	1*	IFC	2*
176	Q37	Painting/Insulation Inspection Reports						
177	Q38	Inspection Release Certificate		DE-14D	IFA	1*	IFC	2*
178	Q39	Photographs/Videos						
179	Q40	Weld Overlay/Cladding Procedures, where applicable						
180	Q41	Cleaning and Flushing Procedures						
181	Q42	PMI Procedures and PMI Location Plan						
182	Q43	Pickling and Passivation Procedures						
183	Q44	Tube to Tube sheet Joint Mock-Up Test Procedure						
184	Q45	Tube to Tube sheet Mock-Up Test Results						
185	Q46	Pitting and Crevice Corrosion Resistance Test Procedure (ASTM G48)						
186	Q47	Intergranular Corrosion Test Procedure (ASTM 262)						
187	Q48	Coupon Test Procedure						
188	Q49	Continuity Test Procedure and Results required for all internal Coatings						
189	Q50	Weld Repair Report (if applicable)						
190	Q51	P.M.I Test Certificate for WO Cladding						
191	Q52	Hardness Test Procedure						
192	Q53	Hardness Test Certificate						
193	Q54	Impact Test Record						
194	Q55	NPSH / Acceleration head Test Procedure						
195	Q56	NPSH / Acceleration head Test Report						
	7	**MANUAL AND INDICES**						
196	R01	Installation, Operation and Maintenance Manual (IOM)		PO+56D	IFA	1*	IFC	*2
197	R02	Manufacturer's Data Record (MDR)		PO+56D	IFA	1*	IFC	*2
198	R03	Training Manuals (Operation and Maintenance)						
199	R04	Not used						
200	R05	Manufacturer's Data Book (MDB) Index		PO+86D	IFA	1*	IFC	*2
	8	**MISCELLANEOUS**						
201	TBA	TBA						

APPENDIX No.2

PURCHASER FORMS

(08 pages, including this page)

Deviation from Purchaser's Specification	Project	H3PO4 ACID STORAGE TANK	Vendor	
	PTSC Project No.		Vendor Project No.	
	Item No.		Contract No.	
	Service			

Spec. No.	Paragraph No.	Deviation	Reason for Deviation	Conclusion	Remarks	Cost Effect When Deviation is Applied

SPARE PARTS LIST FOR INSTALLATION, COMMISSIONING	Project	H3PO4 ACID STORAGE TANK	Vendor	
	PTSC Project No.		Vendor Project No.	
	Item No.		Contract No.	
	Service			

Item no.	Part name	Drawing no.	Part no.	Spec (material)	Installed Q'ty per unit	Recommended Q'ty	Sketch	Unit price	Total price

SPARE PARTS LIST FOR 2-YEAR OPERATION	Project	H3PO4 ACID STORAGE TANK	Vendor	
	PTSC Project No.		Vendor Project No.	
	Item No.		Contract No.	
	Service			

Item no.	Part name	Drawing no.	Part no.	Spec (material)	Installed Q'ty per unit	Recommended Q'ty	Sketch	Unit price	Total price

SPECIAL TOOL LIST	Project	H3PO4 ACID STORAGE TANK	Vendor	
	PTSC Project No.		Vendor Project No.	
	Item No.		Contract No.	
	Service			

No.	Tool name	Q'ty	Sketch	Unit price	Total price

LUBRICANTS LIST	Project	H3PO4 ACID STORAGE TANK	Vendor	
	PTSC Project No.		Vendor Project No.	
	Item No.		Contract No.	
	Service			

Equipment		Parts to be lubricated		Lubricant				Q'ty per unit & interval					Notes
Item no.	Q'ty	Part name	Part Q'ty per unit	Brand			Type	Initial charge (L)	Replacement charge		Make-up		
									Q'ty (L/set)	interval	Q'ty (L/set)	Interval	

ELECTRIC LOAD LIST	Project	H3PO4 ACID STORAGE TANK	Vendor	
	PTSC Project No.		Vendor Project No.	
	Item No.		Contract No.	
	Service			

Item no.	Power source (V/ph/hz)	Rating (kW)	BHP (kW)	RPM at FL	Current (A)				Eff. (%)		Power factor		Time		WL (kg)	Brg lub.	Fr. no.	Brg no.		RTD			Space heater			Hub (in)
					ST	FL	LR	NL	3/4	FL	3/4	FL	ST	STL				Fr.	Re.	No/ph	Mat	Ohm	V/Ph/hz	kW	℃	

UTILITY CONSUMPTION LIST	Project	H3PO4 ACID STORAGE TANK	Vendor	
	PTSC Project No.		Vendor Project No.	
	Item No.		Contract No.	
	Service			

Item no.	Utility name	Consumption	Unit	Conditions			Connection		Remark
				Pressure (kPa.g)	Temp (^oC)		Size	Rating & facing	

APPENDIX No.3

TYPICAL INSPECTION AND TEST PLAN

(02 pages, including this page)

TYPICAL INSPECTION AND TEST PLAN

No.	Inspection Item	Inspection Involvement		
		VENDOR / MANUFACTURE	PURCHASER	COMPANY
1	Visual Check	W	W	W
2	Dimensional Check	W	W	W
3	Material certificates	D	R	R
4	Material identification	D	R	R
5	Verification of Specification	D	R	R
6	Quality Audit	D	R	R
7	Electrical Continuity Test	D	R	R
8	Insulation Resistance Test	W	W	W
9	Dielectric Strength Test	W	W	W
10	Factory Acceptance Tests (FAT)	W	W	W
11	Final Inspection & Inspection Release Certificates	D	H	H
12	Final Documentation as per VDRL and Specifications	D	H	H
13	Shipping Inspection & Shipping Release Notice	D	H	H

Note:

1. R: Review Documents; RI: Random Inspection; W: Witness; M: Monitoring; H: Hold Point; D: Document provided; V: Verify; N/A: Not Applicable
2. The inspection points specified in this Inspection and Testing Requirements (ITR) shall be the minimum required. The PURCHASER has the right to request additional inspection points where it is deemed require

APPENDIX No.4

MTO FOR POWER CABLE AND CONTROL CABLE

(02 pages, including this page)

PETROVIETNAM PVFCCo	ĐẦU TƯ BỒN ACID H3PO4 TẠI XƯỞNG NPK	PTSC A member of PETROVIETNAM
	MTO FOR POWER CABLE AND CONTROL CABLE	H3PO4-PTSC-EL-TRD-0004
		LXB: A

No	Discipline	Item	Material Description	Unit	Quantity	Remarks
1	EL3	E&I Cable	Electrical Cable; Electrical Power & Control Cable; 0.6/1kV; 4C + E; 120mm2; Insulated Black; Stranded copper; Unarmoured; XLPE/PVC;	m	700	
2	EL3	E&I Cable	Electrical Cable; Electrical Power & Control Cable; 0.6/1kV; 2C + E; 10mm2; Insulated Black; Stranded copper; Unarmoured; XLPE/PVC;	m	380	
3	EL3	E&I Cable	Electrical Cable; Electrical Power & Control Cable; 0.6/1kV; 3C + E; 70mm2; Insulated Black; Stranded copper; Unarmoured; XLPE/PVC;	m	140	
4	EL3	E&I Cable	Electrical Cable; Electrical Power & Control Cable; 0.6/1kV; 10C; 2.5mm2; Insulated Grey; Stranded copper; Unarmoured; XLPE/PVC;	m	100	
5	EL3	E&I Cable	Electrical Cable; Electrical Power & Control Cable; 0.6/1kV; 2C + E; 2.5mm2; Insulated Black; Stranded copper; DSTA (Double Steel Tape Armoured); XLPE/PVC;	m	650	
6	EL3	E&I Cable	Electrical Cable; Electrical Power & Control Cable; 0.6/1kV; 3C + E; 35mm2; Insulated Black; Stranded copper; Unarmoured; XLPE/PVC;	m	100	
7	EL3	E&I Cable	Electrical Cable; Electrical Power & Control Cable; 0.6/1kV; 7C; 1.5mm2; Insulated Grey; Stranded copper; Unarmoured; XLPE/PVC;	m	200	
8	EL3	E&I Cable	Electrical Cable; Electrical Power & Control Cable; 0.6/1kV; 3C + E; 10mm2; Insulated Black; Stranded copper; Unarmoured; XLPE/PVC;	m	100	
9	EL3	E&I Cable	Electrical Cable; Electrical Power & Control Cable; 0.6/1kV; 3C + E; 4mm2; Insulated Black; Stranded copper; Unarmoured; XLPE/PVC;	m	100	
10	EL3	E&I Cable	Electrical Cable; Electrical Power & Control Cable; 0.6/1kV; 3C + E; 6mm2; Insulated Black; Stranded copper; Unarmoured; XLPE/PVC;	m	100	
11	EL3	E&I Cable	Electrical Cable; Earthing Cable; 450/750V; 1C; 10mm2; Insulated Green-Yellow Stripe; Stranded copper; Unarmoured; PVC;	m	100	
12	EL3	E&I Cable	Electrical Cable; Earthing Cable; 450/750V; 1C; 50mm2; Insulated Green-Yellow Stripe; Stranded copper; Unarmoured; PVC;	m	100	

APPENDIX No.5

MTO FOR INSTRUMENT CABLE

(02 pages, including this page)

PETROVIETNAM PVFCCo

ĐẦU TƯ BỒN ACID H3PO4 TẠI XƯỞNG NPK

PTSC A member of PETROVIETNAM

MTO FOR INSTRUMENT CABLE

H3PO4-PTSC-EL-TRD-0004

LXB: B

STT	TÊN THIẾT BỊ	MÔ TẢ	VẬT LIỆU	NHÀ CUNG CẤP	ĐƠN VỊ	SỐ LƯỢNG	DỰ PHÒNG	TỔNG CỘNG	GHI CHÚ
1	Cable	1 Pr x 1.5mm2, 300/500V, Cu/XLPE/ISOS/LSZH/SWA/PVC-Flame retardant, Black Colour	VTA	VTA	M	246	12	258	
2	Cable	10 Pr x 1.5mm2, 300/500V, Cu/XLPE/ISOS/LSZH/SWA/PVC-Flame retardant, Black Colour	VTA	VTA	M	340	17	357	
3	Cable	2 C x 2.5mm2, 300/500V, Cu/XLPE/LSZH/SWA/PVC-Flame retardant, Black Colour	VTA	VTA	M	360	18	378	
4	Cable	24 C x 1.5mm2, 300/500V, Cu/XLPE/LSZH/SWA/PVC-Flame retardant, Black Colour	VTA	VTA	M	740	37	777	
5	Cable	2 C x 1.5mm2, 300/500V, Cu/MICA/XLPE/LSZH/SWB/PVC-Fire Resistance, Red Colour	VTA	VTA	M	498	25	523	
6	Cable	2 C x 2.5mm2, 300/500V, Cu/MICA/XLPE/LSZH/SWB/PVC-Fire Resistance, Black Colour	VTA	VTA	M	192	10	202	
7	Cable	1C x 4mm2, 150/250V, Cu/PVC, Green / Yellow Colour	VTA	VTA	M	100	5	105	