INVITATION TO BID

Bidding package No.	**91-VT-1614/25-XL-TTHN**
Title of bidding package:	**Valves, Piping, Fitting & Structure materials để lắp đặt van điều áp**
Name of the project:	**Block 04-3 Project**
Issued on:	**19/05/2026 to 09:00 AM date 08/06/2026**
Issued including Decision:	**ITB No. 5561/26-HSMT-PTM/BMĐH approved 16/05/2026**

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BRIEF DESCRIPTION

Part 1. BIDDING PROCEDURES

Chapter I. Instructions to bidders

This Chapter provides information to help bidder in preparation of Bid Proposal. Information includes rules of preparation, submission of Bid Proposal, bid opening, bid evaluation and contract award. Chapter I contains provisions that are to be used without modification.

Chapter II. Bidding data sheet

This Chapter specifies in detail contents of Chapter I for applying for each bidding package.

Chapter III. Bid proposal evaluation criteria

This Chapter includes criteria for evaluation of Bid Proposal.

Chapter IV. Bidding forms

This Chapter includes forms that bidder shall complete to form a part of Bid Proposal.

Part 2. TECHNICAL REQUIREMENTS

Chapter V. Technical requirements

This Chapter includes scope, progress of goods supply, technical requirements, drawing for description the specification of goods and related services; contents on inspection and testing of goods (if any).

Part 3. TERMS AND CONDITIONS OF CONTRACT AND CONTRACT FORMS

Chapter VI. General Conditions of Contract

This Chapter includes general conditions applied for all contracts of various bidding packages. Chapter VI contains common provisions that are are completed by awarded bidder before contract comes into effect.

Chapter VII. Particular Conditions of Contract

This Chapter includes contract data and specific conditions, which specifies detailed conditions for each contract. Particular conditions of contract are to be modified and supplemented but not to replace general conditions of Contract.

Chapter VIII. Contract forms

This Chapter includes forms which, once completed, shall become integrated part of contract. Forms of contract performance guarantee (Performance Bond) and Advance payment guarantee (if any) are completed by awarded bidder before contract comes into effect.

Part 4. APPENDICES

- Attachment 01: Scope of supply
- Attachment 02: Technical requirements
- Attachment 03: Technical evaluation criteria
- Other technical documents, … with link for reference (if any).

ABBREVIATION

ITB	Instructions to Bid
BDS	Bid data sheet
GCC	General conditions of contract
PCC	Particular conditions of contract
VND	Vietnam Dong
USD	US Dollar
EUR	European currency

Part 1. BIDDING PROCEDURES

Chapter I. INSTRUCTIONS TO BIDDERS

1. Scope of bid	1.1. Employer as specified in the Bid Data Sheet (BDS) issues this Invitation to Bid for selection of Bidder to implement bidding package for procurement of goods folowing single-stage one-envelope procedure. 1.2. Title of the bidding package; number, quantity of parts (in case bidding package is divided into many independent parts) belongs to bidding package as specified in BDS.
2. Explanation of terms used in bidding	2.1. The Deadline for bid submission is the deadline for submission bids and is specified in the Invitation to Bid. 2.2. Day refers to Gregorian calendar day, including weekends, holidays, and Tet holidays according to the provisions of labor law. 2.3. Time and day, month on the national bidding network shall be defined time and day, month published the national bidding network (GMT+7).
3. Source of funds	Source of funding (or method of capital arrangement) for bidding package as specified in **BDS**.
4. Prohibited acts in bidding	4.1. Offering, giving, receiving or taking a bribe. 4.2. Abusing positions or entrusted power to influence or illegally intervene in bidding process in any form. 4.3. Collusive practice, including: a) Reaching, with or without undue influence, an arrangement or agreement which is designed to let one or more parties to prepare bids for all bidders or to withdraw submitted bids so that one of them will win the bid; b) Reaching an arrangement or agreement on refusal to supply goods or services, or subcontract, or reaching other agreements to limit competition so that one party will win the bid; c) A bidder or investor with appropriate qualifications and experience has submitted a bid and meets the requirements laid down in the Invitation to Bid but deliberately refuses to provide additional documents proving their capacity and experience at the Vietsovpetro's request for clarification of the bid or verification of their submitted documents with the aim of facilitating one party's winning of the bid. 4.4. Fraudulent practice, including: a) Forging or falsifying information and/or documents used in bidding; b) Deliberately providing information and documents which are not accurate or objective in bids or proposals with the aim of falsifying the contractor selection result. 4.5. Obstructive practice, including: a) Destroying, deceiving, altering or concealing of evidence or making false statements; threatening, harassing or intimidating any party to prevent the verification or investigation into a corrupt, fraudulent or collusive practice made with a supervision, inspection or audit authority;

	b) Obstructing the competent person, employer, Vietsovpetro, bidders in the course of contractor selection; c) Impeding competent authorities' rights of supervision, inspection or audit of bidding activities; d) Deliberately making false complaints, denunciations or petitions with the aim of impeding bidding process; e) Acts of violation against laws and regulations on cybersecurity and safety intended to intervene or impede the online bidding process. 4.6. Inequality and non-transparency, including: a) A bidder of a package or investment project is also the Vietsovpetro or employer or takes charge of performing tasks of the Vietsovpetro or employer of that package or investment project, violating against the regulations stated in Point 5 ITB; b) A person or entity concurrently engages in the preparation and appraisal of Invitation to Bid, or RFP of the same package or investment project; c) A person or entity concurrently engages in the evaluation of bids or proposals and the appraisal of the contractor selection result of the same package or investment project; d) A person who is working for the Vietsovpetro/employer directly engages in the contractor selection, or acts as a member of the expert team or appraising team in charge of appraising the contractor selection result, or is a competent person or head of the Vietsovpetro/employer, for a package or investment project for which his/her family relative, as defined in the Law on enterprises, directly submits a bid or acts as the legal representative of a bidder; e) A bidder submits a bid for a procurement, construction or non-consulting service package for which the bidder is also acting as a consultant on preparation, verification and appraisal of cost estimate, technical design, building drawings and designs, front-end engineering design (FEED); preparation and appraisal of Invitation to Bid; evaluation of bids; inspection of goods; appraisal of contractor selection result; supervision of contract execution; f) A person acts as a bidder for a package of a project or investment project of the Vietsovpetro or employer for which he/she worked and held the executive or managerial position within 12 months from the date of his/her resignation therefrom; g) A supervision consultant also acts as the inspection consultant of the same package; 4.7. Unauthorized disclosure of the following information and documents on the contractor/investor selection: a) Contents of bidding documents before they are issued as prescribed; b) Contents of Bids, notebooks, minutes of bid evaluation meetings, comments and evaluations for each Bids before publishing contractor selection result; c) Content of request for clarification of Bid proposals of the Vietsovpetro and responses of bidders during the evaluation process of Bid proposals before publising the bidder selection result;

	d) Report of the Vietsovpetro, report of the Expert Group, appraisal report, report of consulting bidder, report of relevant professional authorized organization during the bidder selection process before publishing the bidder selection result; e) The bidder selection result before being published arcording to regulation as prescribed. 4.8. Illegal transfer of awarded contract: The contractor transfers to other contractor(s) a workload of task of the package worth more than 10% of package value; or worth less than 10% of package value but more than 02 million USD (after deducting the workload of the subcontractor's responsibility as declared in the contract), calculated on the signed Contract price.
5. Eligibility of bidders	A bidder that is an organization shall be deemed to be eligible if complying the following requirements: a) It is requried to have registration of establishment and operation issued by the competent authority of the country where the bidder is operating; b) It must keep independent accounting records; c) It is not undergoing dissolution process or subject to revocation of enterprise registration certificate, cooperative/cooperative union/artel registration certificate; is not facing insolvency as prescribed by the law on bankruptcy; d) It must ensure competitiveness in bidding as prescribed in Point BDS; e) It is not being prohibited from participating in bidding; f) It is not liable to criminal prosecution; g) It is not the state of temporary suspension, termination of participation in national bidding network; h) It is name is registered on National bidding network before the grant of approval for contractor selection result as prescribed in BDS.
6. Contents of Invitation to Bid	6.1. The Invitation to Bid consists of Parts 1, 2, 3, 4 accompanied with documents of Bid Proposal amendment as specified in ITB 7 (if any) including as follows: **Part 1. Bidding Procedures:** - Chapter I. Instructions to Bidders (ITB); - Chapter II. Bidding Data Sheet (BDS); - Chapter III. Bid Proposal Evaluation Criteria; - Chapter IV. Bidding Forms. **Part 2. Technical Requirements:** Chapter V. Technical Requirements. **Part 3. Conditions and Forms of Contract:** This part includes the terms, conditions, data and forms that constitute the complete contract. **Part 4. Appendices** 6.2. Vietsovpetro is not responsible for the preciseness, completeness of the Invitation to Bid, explanation for clarification documents or amendment of Invitation to Bid as prescribed in ITB

	7 if these documents are not provided by Vietsovpetro. In case of any contradiction, documents issued by Vietsovpetro shall prevail. 6.3. The bidder shall examine all instructions, forms, supply requirements and other requirements in the Invitation to Bid for preparation Bid Proposal including all information or documentation as required by the Invitation to Bid.
7. Clarification and amendment of Invitation to Bid	7.1. The amendment of the Invitation to Bid shall be made as prescribed in **BDS** prior to the deadline for submission of bid proposal by issuing the written documentation for amendment in accordance with the methods as prescribed in **BDS**. To give bidders reasonable time in preparing their bid proposal, Vietsovpetro may, at its discretion, extend the deadline for the submission of bid proposals. 7.2. Any bidder who needs clarification of the ITB shall send a written request to Vietsovpetro in a minimum period of time as presribed in the **BDS** prior to date of Deadline for bid submission in order that Viesovpetro shall take consideration. After receiving the written request for clarification by the deadline, Vietsovpetro shall make a written clarification response in a minimum period of time as prescribed in **BDS**, that specifying clarification content request without specifying the name of the requesting bidder, and send it to every bidder who have received the ITB from the Vietsovpetro. If the clarification leads to amendment ITB, Vietsovpetro shall amend the ITB in accordance with ITB 7.1. 7.3. If necessary Vietsovpetro hold pre-bidding conference to discuss the contents in Bidding Document in which the bidders are unclear as stiupulated in **BDS**. Vietsovpetro shall send an invitation to the pre-bidding conference to all contractors who have received the Invitation to Bid and post it on the System. The discussion shall be formally recorded as minutes of clarification which shall be sent to all bidders who have bought or acquired Invitation to Bid from Vietsovpetro. 7.4. In case the Invitation to Bid is required to be modified after the pre-tender conference, Vietsovpetro shall issue a written document for amendment as specified in ITB 7.1, minutes of pre-bidding conference is not the amendment of Invitation to Bid. 7.5. No participation in pre-bidding conference or without a confirmation letter that bidder having particiated in pre-bidding conference is not the reason to reject the Bid proposals' bidder.
8. Cost of bidding	The bidder shall bear all costs associated with the preparation and submission of its Bid Proposal. Vietsovpetro shall not be liable for those cost under any circumstances.
9. Language of Bid Proposal	The bid proposal, as well as all correspondence and documents relating to the bid proposal exchanged by the bidder and Vietsovpetro, shall be written in English. Any supporting documents in bid proposal can be written in other languages and concurrently attached with translation in English. In case of no translation, if necessary, Vietsovpetro may ask bidder for supplementation of documents.
10. Documents comprising the Bid Proposal	The Bid Proposal shall comprise of the following: 10.1. Application for bidding in accordance with ITB 11;

	10.2. Consortium agreement in case the bidder is Consortium in accordance with Form 03, Chapter IV – Bidding forms; 10.3. Bid Bond, in accordance with ITB 18; 10.4. Proof documents for eligibility of bidder in accordance with ITB 5; 10.5. Proof documents for eligibility of signatory under the application for bidding, in accordance with ITB 20.3; 10.6. Proof documents for capacity and experience of bidder, in accordance with ITB 16; 10.7. Technical proposals and proof document for adequacy of goods and related services, in accordance with ITB 15; 10.8. Price proposals and price schedules with full information, in accordance with ITB 11, 13; 10.9. Proposals of technical alternatives, in accordance with ITB 12 (if any); 10.10. Other contents as specified in **BDS**.
11. Application for bidding form and price schedules	The application for bidding form and respective price schedules shall be prepared using the relevant forms furnished in Chapter IV, Bidding Forms.
12. Proposals of technical alternatives	12.1. In case Invitation to Bid stipulates in **BDS** for probability of technical alternatives, then those technical alternatives shall be considered. 12.2. Technical alternatives are only considered when main solution meets requirements and bidder is ranked first. In this case, bidder shall provide all information necessary for evaluation of the alternatives by Vietsovpetro, including: notes, drawings, technical specifications, progress of supply, costs and other relevant information. The evaluation of technical alternatives in accordance with Section 5, Chapter III.
13. Biding prices and discounts	13.1. Bidding price stated in the Application for bidding and in the bidding price tables with discounts must comply with the regulations as specified in this Section: a) The bidding prices means the price stated in Application for bidding, including all costs for implementation of bidding package (not including discounts). b) In case the bidding packages is not devided into independent parts, on condition that bidder offers discount, this can be offered directly in Application for Bidding or put in separate letter for discount. Bidder has to specify the content of discount and details of discount allocation into specific items in columns of "List of goods", "Services description". In case details are not provided, the discount is assumed to apply uniformly for all items in the columns of "List of goods", "Services description". Letter for discount (if any) can be submitted with Bid Proposal or separately provided that Vietsovpetro receive prior to Deadline for bid submission. c) Bidder shall submit Bid Proposal for all work described in ITB 1.1 and offer unit prices, extended amount for work specified in columns of "List of goods", "Services description" in accordance with respective Form prescribed in Chapter IV – Bidding forms. In case columns "Unit price" and "Extended amount" are not offered or offered "0", it is assumed that bidder allocates prices of

	these goods and services into others prices of those in bidding package, bidder is responsible to provide goods, services in accordance with requirements of Invitation to Bid and not receive payment from Vietsovptero during implementation of contract. Bidder is required to offer prices in each Price schedules as prescribed in **BDS**. 13.2. In case bidding package is divided into independent parts and bidder is allowed bidding in each part specified in BDS, bidder is able to bid for one or many parts of bidding package. Bidder has to bid all work of such part which the bidder attends. Should the bidder offer discount, bidder shall specify details and prices of discount in each part as per ITB 1.2. 13.3. The bidder shall be responsible for the bidding price quoted to perform and complete the work in accordance with the requirements as stated in the Invitation to Bid. In case the biddier offer a low unit price in abnormal manner which affecting to the quality of the bidding package, the Vietsovpetro may require the bidder to clarify the feasibility of such abnormal unit price. 13.4. Bidder's bidding price quoted shall include all taxes, fees and charges (if any) in response to tax rates, expenses, fees at the time of 28 days prior to the stipulated deadline for bid submission. In case bidders announce bidding prices not including taxes, fees, charges (if any), bidders' Bid Proposal shall be rejected. 13.5. Bidders offer the bidding price as stipulated in **BDS**.
14. Currencies of Bid and payment	14.1. The currency of the bid shall be offered in *VND/ USD/ EUR*. Cost incurred inside Vietnam shall be offered in VND. Cost incurred outside Vietnam shall be offered in *VND/ USD/ EUR*. Bidders have to offer by only one currency for a specific work. In case bidding price is offered in foreign currency, bidder has to prove that the respective work has been using foreign currency. 14.2. The currency of payment for work items shall correspond with the currency of bid for those items. Domestic costs are only paid in VND. 14.3. The currency for conversion of different bidding prices from various currencies into unique currency for evaluation and comparison is: VND/USD applying the selling rate stated by Vietcombank on the date when the bid is closed. If all bidding prices are in foreign currency, then bid evaluation and comparison shall be done in USD. In the event that one of bidding prices is in VND, then bid evaluation and comparison shall be done in VND. 14.4. Without prejudice to any terms mentioned above and relevant applicable laws, contract currency for domestic bidders shall be in VND, applying the selling rate stated by Vietcombank on the date when the bid is closed.
15. Documents establishing the conformity of the Goods and related services	15.1. To establish the eligibility of the goods and related services in accordance with Invitation to Bid, the bidder shall furnish as part of its Bid Proposal the documentary evidence that the goods conform to the technical specifications and standards specified in Chapter V. 15.2. The term "Goods" is construed including but not limited to machinery, equipment, raw materials, fuel, materials, supplies,

	accessories; consumables; medical supplies used for medical establishment. 15.3. The term "origin" shall mean as country or territory where produces whole goods or implements final basic processing in case many countries or territories take part in production process of those goods. 15.4. The term "Related Services" including but not limited to the Services such as: warranty, maintenance, overhaul, repair, supply of spare parts or supply of other after sales services like training, technology transfer, … 15.5. The documentary evidence responsiveness of the goods and related services may be in the form of documents, drawings, data, and shall consist of a detailed item by item description of the essential technical and performance characteristics of the goods and related services, demonstrating substantial responsiveness of the goods and related services to the technical specification, and if applicable, a statement of deviations and exceptions to the provisions of the Chapter V. 15.6. The bidder shall also provide a list giving full particulars, current prices of spare parts, special tools, etc., necessary for the proper and continuing functioning of the goods during the period specified in the **BDS** following commencement of the use of the goods. 15.7. Standards for manufacturing, production process of material and equipment, as well as references to brand names or catalogue numbers specified by Vietsovpetro in the Chapter V, are intended to be descriptive only and not restrictive to bidder. The bidder may offer other standards of quality, brand names, catalogue numbers, provided that it demonstrates, to Vietsovpetro's satisfaction, that the substitutions ensure substantial equivalence or are superior to those specified in the Chapter V.
16. Documents establishing the capacity and experiences of the bidder	16.1. The bidder shall provide necessary information in Forms in Chapter IV – Bidding Forms in order to demonstrate capacity and experiences for performance of contract as specified in Chapter III – Bid Proposal evaluation criteria. The bidder shall prepare original documents for verification with information stated in bidder's Bid proposal if Vietsovpetro requires. 16.2. The documentary evidence of the bidder's capacity to perform the contract if its bid proposal is awared as specified in **BDS**.
17. Period of validity of Bid Proposal	17.1. Bid Proposal shall remain valid not shorter than the period specified in the **BDS**. 17.2. In exceptional circumstances, prior to the expiration of the bid proposal's validity period, Vietsovpetro may request bidders to extend the period of validity of their Bid Proposal. The Bid Bond as also requested shall be extended for 30 days beyond the deadline of the extended validity period. If a bidder refuses to extend its Bid Proposal validity as required, the Bid Proposal shall not be further considered and the Bid Bond shall be returned to bidder. The bidder have accepted Vietsovpetro's extension request shall not be permitted to modify any contents of its Bid Proposal. The extension request and acceptance or non-acceptance shall be in writing.

18. Bid Guarantee	18.1. When attending the bid, prior to deadline for bid submission, the bidder shall implement bid guarantee and attach it to Bid proposal under the following forms: i) a form unconditional guarantee issued by a bank or financial institution which is legally operating in Vietnam or foreign bank branches established under Vietnamese law; ii) submit a certificate of insurance guarantee issued by a domestic non-life insurance enterprise, or branch of a foreign non-life insurance enterprise established under the Vietnamese law; iii) pay a deposit or bank transfer to VSP's account as specified in **BDS** 18.2. In case the validity of Bid proposal is extended as specified in ITB 17.2, the Bid bond's validity shall be accrodingly extended. In case of consortium bidder, all partners of consortium shall implement the same form of Bid bond. In case of Consortium, the Bid Bond shall comply with one of the following: a) Each Consortium partner shall provide a separate Bid Bond; however, the aggregate amount of Bid Bond submitted by all Consortium partners is not less than the required amount specified in ITB 18.2. If the Bid Bond of any Consortium partner is determined to be invalid, the bid of the Consortium shall not be considered and evaluated further. If any Consortium partner is in breach of the rules resulting in without return of Bid Bond in accordance with point b ITB 18.5, then Bid bond of all Consortium partners shall not be returned. b) All partners of the Consortium shall nominate one partner to arrange a single Bid Bond for itself and all other partners in the Consortium. In this case, the Bid Bond shall be in the name of the Consortium or the name of the partner who arranges the Bid Bond for the entire Consortium provided that the total amount is not less than the required amount in BDS of ITB 18.2. If any Consortium partner is in breach of the rules resulting in without return of the Bid Bond in accordance with ITB 18.5, the Bid Bond shall not be returned. 18.2. Amount, currency and valid period of the Bid Bond shall be as specified in the **BDS**. 18.3. The Bid Bond shall be considered illegitimate in one of following cases: having lower value, with shorter valid period as specified in ITB 18.2, incorrectly states the name of the beneficiary, not original and without legitimate signature, signed before Vietsovpetro issues the Invitation to Bid or accompanied with adverse condition for Vietsovpetro (including not fully committed with content of the Bid Bond Forms – 04A, 04B, 04C in Chapter IV). In case of using a letter of guarantee or certificate of insurance, the letter of guarantee or certificate of insurance must be provided, signed and stamped (if applied) by one of the following: a lawful representative of a domestic credit institution, a branch of a foreign bank established under Vietnamese law, a domestic non-life insurance enterprise, a branch of foreign non-life insurance enterprise established under Vietnamese law. In case of using a letter of guarantee (of deposit/transfer to Vietsovpetro's account), the letter must be signed and stamped by the legal representative of

	the contractor. 18.4. Unsuccessful bidder shall be returned or released the Bid Bond in the maximum duration specified in the **BDS** since the date for notification of result of selecting bidder. For successful bidder, the Bid Bond shall be returned or released after the bidder furnishes the contract performance guarantee. 18.5. The Bid Bond shall not be returned in one of following cases: a) After the deadline for submission of bids and during the validity period of the bid, the bidder withdraws their Bid proposals or gives a written refusal to perform one or some tasks proposed in their Bid proposals in accordance with the requirements laid down in the Invitation to Bid; b) The bidder performs any of the prohibited acts specified in Point 4 ITB or commits violations of the bidding law resulting in bid cancellation as prescribed in Point 32 ITB; c) The successful bidder fails to furnish the required performance security as prescribed Point 37 ITB; The first ranked bidder is invited to negotiate the Contract. Within seven (07) days from the date of receipt of the invitation to negotiate the Contract from Vietsovpetro, the bidder does not come to negotiate or refuses to negotiate the Contract or offers conditions different from the content in the Bid Proposals or withdrawing commitments in the Bid Proposals resulting to unsuccessful Contract negotiations, the Bid bond shall be not returned to bidder, except in cases of force majeure; d) The bidder fails or refuses to complete the Contract within twenty (20) days from the date of receipt of notification of Bid award from Vietsovpetro, except in cases of force majeure; e) The bidder refuses to sign the Contract within ten (10) days from the date of completion of the Contract, except in cases of force majeure. 18.6. In case the Invitation to Bid is divided into independent parts, bidder may submit the bid bond in either of the two ways as follows: a) A bid bond for all parts that bidder participate in the bidding (the value of bid bond will be equal to the total values of the parts that bidder takes part in). Where the value of bid bond submitted by the bidder is less than the total of values, Vietsovpetro is entitled to decide the application of such bid bond to the parts that bidder takes part in; b) Separated bid bonds for each part that bidder takes part in the bidding. Where the bidder's breach results in a failure to refund the bid bond as stipulated in section ITB 18.5, the failure to refund the value of bid bond shall be calculated on the part violated by the bidder.
19. Deadline for bid submission	19.1. The deadline for bid submission is the time specified in the **BDS**. 19.2. Vietsovpetro may at its discretion, extend the deadline for the submission of Bid Proposal by amending the Invitation to Bid in accordance with ITB 8, in which case all rights and obligations of Vietsovpetro and bidders previously subject to the deadline shall thereafter be subject to the new deadline as extended.

	19.3. The bidder submits directly or delivers the Bid Proposal to Vietsovpetro adresss provided that it arrives before deadline for submission of bid specified in the **BDS**. Vietsovpetro receive Bid Proposal of all bidders before deadline for submission of bid, including even if bidder has not bought or received the Invitation to Bid from Vietsovpetro. In such case, the bidder shall pay an amount equal to the selling price of the Invitation to Bid to Vietsovpetro account prior to the Bid Proposal is received and before the deadline for bid submission.
20. Submission, withdrawal, substitution and amendment of Bid Proposal	20.1. The bidder shall prepare Bid Proposal comprising: one original as specified in ITB 10 and some copies with amount mentioned in the **BDS**. The cover of dossier shall be marked clearly "ORIGINAL OF BID PROPOSAL", "COPY OF BID PROPOSAL". In case of amendment, alternative of Bid Proposal, the bidder shall prepare one original and some copies of dossier with amount specified in the **BDS**. The cover of dossier shall be marked clearly "ORIGINAL OF AMENDED BID PROPOSAL", "COPY OF AMENDED BID PROPOSAL", "ORIGINAL OF ALTERNATIVE", "COPY OF ALTERNATIVE". In case of technical alternative in the Bid Proposal specified in ITB 12, the bidder shall prepare one original and some copies with amount mentioned in **BDS**. The cover of dossier shall be marked clearly "ORIGINAL OF TECHNICAL ALTERNATIVE", "COPY OF TECHNICAL ALTERNATIVE OPTION". 20.2. Bidders shall be responsible for the appropriateness of the copies compared to the original. In case of deviation between original and copy but without changing the bidder ranking, the original shall be used for evaluation. In case of deviation between original and copy leading to different results in evaluation of original and the copy, and resulting change in the bidder ranking, the Bid Proposal of that bidder shall be rejected. 20.3. The original of Bid Proposal shall be typed, printed with inerasable ink, with continuous page numbers. The application for bidding form letter, letter of discount (if any), supplementary documents, clarifying the Bid Proposal, price offer list and other forms in Chapter IV – Bidding forms shall be signed and stamped by the bidder's legitimate representative or the bidder's legitimate attorney (if any), in case of attorney, letter of attorney specified in Form 02, Chapter IV – Bidding forms or certified copy of company charter, decision on establishment of branch or other documents to demonstrate power of attorney shall be submitted with the Bid Proposal. 20.4. In case of Consortium bidders, Bid Proposal shall be signed by legal representative of all partners in Consortium or legal partner representating Consortium bidders according to Consortium agreement. In order that all partnerss of Consortium to be legally bound, Consortium agreement must be signed by legal representatives of all partners of Consortium. 20.5. Any words added, written between lines, erased, overwritten shall only be deemed legitimate if having signature nearby or in that page of signatory on the application for bidding letter.

	20.6. The envelope of Bid Proposal comprises of original and copies, duly marking “BID PROPOSAL”. In case of amendment, alternative of Bid Proposal, then the amended, alternative document (including original and copies) shall be placed in separated envelopes other than the envelope for Bid Proposal, clearly marking “AMENDMENT OF BID PROPOSAL”, “ALTERNATIVE BID PROPOSAL”. In case the bidder proposes an alternative technical plan, the entire alternative technical plan, including technical proposals and price proposals, must be contained in separate envlopes from the Bid Proposal envelop, the outside must clearly state "PROPOSED ALTERNATIVE TECHNICAL OPTION". The envelopes: for Bid Proposal; amended Bid Proposal, proposed alternative technical options (if any) must be sealed. Sealing method is according to the bidders' own regulations. 20.7. The envelopes shall: a) bear the name and address of the bidder; b) be addressed to Vietsovpetro in accordance with **BDS**; c) bear title of bidding package in accordance with ITB 1.2; d) bear a warning “not to open before the time and date for bid opening”. 20.8. The bidder shall be responsible for aftermath or disadvantages if is not in accordance with this Invitation to Bid such as not sealing or losing seal of Bid Proposal during delivery to Vietsovpetro, not marking right information on envelopes of Bid Proposal as specified in ITB 20.6 and ITB 20.7. Vietsovpetro shall not be responsible for confidentiality of information in Bid Proposal if the bidders do not comply with above requirements. 20.9. Vietsovpetro shall not consider any Bid Proposals submitted after the Deadline for bid submission. Any Bid Proposals received by Vietsovpetro after the Deadline for bid submission shall be declared late submission, be rejected and be returned unopened to the Bidder. 20.10. After submitting the Bid Proposals, the Bidders may amend, replace or withdraw the Bid Proposals by sending a written notice signed by the bidder's legal representative, in case of attorney, a power of attorney letter must be enclosed as prescribed in ITB 20.3. Dossier for amendment or replacement of Bid Proposal must be enclosed with a written notification of the corresponding amendment, replacement and must ensure the following conditions: a) Being prepared by the Bidders and being submitted to the Vietsovpetro in accordance with ITB 20, the dossier containing the notification must be clearly stated "AMENDMENT OF BID PROPOSAL" or "SUBSITUTION OF BID PROPOSAL" or "WITHDRAWAL OF BID PROPOSAL "; b) Being received by Vietsovpetro before the Deadline for bid submission as stipulated in ITB 19. 20.11. The Bid Proposals which the bidder requests to withdraw in accordance with ITB 20.10 shall be returned unopened to the bidder.

	20.12. The Bidder is not allowed to modify, replace or withdraw the Bid Proposal after the Deadline for bid submission until the expiration of the Bid Proposal's validity as stated in the application for bidding form letter or until the expiration of the extended validity of the Bid Proposal.
21. Bid opening	21.1. Except in the cases specified in ITB 20, Vietsovpetro shall publicly open and read out, clearly information in accordance with ITB 21.3 of all Bid Proposal received before the deadline for submission of bids. The bid opening shall take place publicly at time and place specified in the **BDS** in the presence of bidders and representatives of related organizations. The bid opening does not depend on presence or absence of bidders' representatives attending the bid. 21.2. In case bidder requests withdrawal or substitution of Bid Proposal, Vietsovpetro shall firstly open and read out clearly information in envelope of which outer notification marks "WITHDRAWAL OF BID PROPOSAL", the envelope of Bid Proposal of bidder with request for withdrawal shall remain sealed and be returned unopened to Bidder. Vietosovpetro shall not accept the Bidders' withdrawal of the Bid Proposal and still open such the Bid Proposal if the written notice of "Withdrawal of Bid Proposal" does not include documents providing that the person signing such documents is the bidder's legal representative and must be publicly announced during the bid opening. Next, Vietsovpetro shall open, read out clearly information in envelope of which outer notification marks "SUBSITUTION OF BID PROPOSAL" and this shall be replaced with the previous. This previous shall not be opened and be returned unopened to bidder. Vietsovpetro shall not accept the bidder to replace the Bid Proposal if the written notice of Bid Proposal replacement is not accompanied by documents proving that the person signing the document is the bidder's legal representative and must be made public during the bid opening. For envelope with notification marked "SUBSITUTION OF BID PROPOSAL", any attached notification document accompanied with amended Bid Proposal shall be opened, read out clearly. Vietsovpetro shall not accept the bidder to amend the Bid Proposal if the written notice of Bid Proposal's amendment does not include documents proving that the person signing the document is the bidder's legal representative. Only Bid Proposal opened and read out at the bid opening then shall be considered further and evaluated. 21.3. All the Bid Proposals shall be opened one at a time following the alphabetical sequence of the bidders' names and sequence below: a) Examine the seals; b) Open original of Bid Proposal, amendment of Bid Proposal (if any) and read out clearly at least the following information: name of bidder, quantity of originals and copies, bidding price in letter of bid, bidding price in summarized price list, discount (if any), validity of Bid Proposal, date of contract performance, value, validity of Bid Bond and other necessary information. In case bidding package is divided into many independent parts, then

	bidding prices and discount for each part shall be read out. Only discount read out in bid opening shall be further considered and evaluated; c) Representatives of Vietsovpetro shall countersign in original of letter of bid, Bid Bond, summarized price list, letter of attorney of bidder's legal representative (if any), letter of discount (if any), Consortium agreement (if any). Vietsovpetro shall not reject any Bid Proposal at the bid opening, except for late submission Bid Propsals as specified in ITB 20. 21.4. Vietsovpetro shall prepare a record of the bid opening that shall include information specified in ITB 21.3. The record shall be signed by representatives of Vietsovpetro and bidders attending bid opening. The omission of a bidder's signature on the record shall not invalidate the contents and effect of the record. The record shall be distributed to all bidders attending the bid.
22. Confidentiality	22.1. Information relating to the evaluation of bids and recommendation of contract award shall not be disclosed to bidders or any other persons not officially concerned with the bidder selection process until publication of result of bidder selection. Under no circumstances, is the information in Bid Proposal revealed to any other bidders, except for the information that need disclosing during the bid opening. 22.2. Except for the case of enquiries for clarification of Bid Proposal and comparing documents, bidder is not allowed to contact with Vietsovpetro for issues related to bidder's Bid Proposal and other relevant issues of bidding package during the time from bid opening until the result of tendered selection is published.
23. Clarification of Bid Proposal	23.1. After bid opening, the bidder shall be responsible to clarify the Bid Proposal if required by Vietsovpetro, including eligibility, capacity and experiences of the Bidder. In terms of technical, financial proposal in bidder's Bid Proposal, the clarification shall comply with the principle of not changing the basic content of the submitted Bid Proposal and not changing the offed bidding price. 23.2. During the evaluation process, clarification of Bid proposal between Bidders and Vietsovpetro is perform directly in written. 23.3. Clarification of Bid Proposals is only performed between the Vietsovpetro and Bidder whose Bid Proposals need to be clarified. In terms of clarification contents that directly affect evaluation of eligibility, capacity, experiences, technical requirement, financial issues, if period of clarification exceeds deadline and bidder does not submit documentation for clarification or submitted documentation does not comply with requirements of clarification from Vietsovpetro, Vietsovpetro shall evaluate based on the Bid Proposal submitted before deadline for bid submission. Vietsovpetro shall give the Bidder a reasonable period of time to clarify the Bid Proposal. 23.4. In case after Deadline for submission of bids, the bidder knowing that the Bid Proposal it has submitted falls short of documents establishing its eligibility, similar contracts, production capacity, financial reports, tax declaration and payment obligations, documents on personnel, specific equipment proposed in its Bid Proposal may provide such evidence to the Procuring

	entity within a period of time specified in the BDS. The Procuring entity shall receive, consider and evaluate the bidder's additional and clarifying documents, which shall be considered as part of the Bid Proposal. 23.5. In case of any inconsistencies in the Bid Proposal's content or on the condition that the content is unclear, Vietsovpetro request clarification toward the bidder based on compliance as specified in ITB 23.1. 23.6. In case of doubt about the authenticity of documents provided by the Bidder, Vietsovpetro shall verify with organizations and individuals related to the content of the documents. 23.7. In case the Invitation to Bid requires the commitment, Contract Principles for equipment rental, main material supply, warranty, upkeep and maintenance, but such documents are not enclosed in the Bid Proposals, Vietsovpetro shall request Bidders to clarify their Bid Proposals and supplement documents within an appropriate period of time but not less than 03 working days as a basis for evaluation of Bid Proposals.
24. Deviations, imposing conditions and omissions	During the evaluation of bid proposal, the following definitions apply: 24.1. "Deviation" is a difference from the requirements specified in the Invitation to Bid; 24.2. "Imposing Conditions" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Invitation to Bid; 24.3. "Omission" is the Bidder's failure to submit part or all of the information or documentation required in the Invitation to Bid.
25. Determination of responsiveness	25.1. Vietsovpetro's determination of a responsiveness of Bid Proposal is to be based on the contents of the Bid Proposal itself, as defined in ITB 10. 25.2. A substantially responsive Bid Proposal is one that meets the requirements of the Invitation to Bid without material deviations, conditions, or omissions. A material deviation, reservation, or omission is one that: a) If accepted, would affect in any substantial way the scope, quality, or performance of the goods and related services; limit in any substantial way, inconsistent with the Invitation to Bid, Vietsovpetro's rights or the bidder's obligations under the contract; b) If rectified, would unfairly affect the competitive position of other bidders presenting substantially responsive Bid proposal that meet the requirement of the Invitation to Bid. 25.3. Vietsovpetro shall examine the technical aspects of the Bid Proposal submitted in accordance with ITB 15 and ITB 16, in particular, to confirm that all requirements of the Invitation to Bid have been complied without any material deviation or reservation, or omission. 25.4. If the Bid Proposal is not substantially responsive to the requirements of Bidding Document, it shall be rejected; not being allowed to deviations, reservation conditions or omission of basic content in such Bid Proposal with the purpose of making Bid Proposal to be met substantially responsive to the requirements of Bidding Document.

26. Nonmaterial mistake	26.1. Provided that a Bid Proposal is substantially responsive, Vietsovpetro may waive any mistakes in the bid proposal that not to be a material deviation, reservation or omission. 26.2. Provided that a bid proposal is substantially responsive, Vietsovpetro may request that the bidder submits the necessary information or documentation, within a reasonable period of time, to rectify inappropriate points or nonmaterial mistake in the bid related to documentation requirements. The request for provsion of information and documentation to rectify such mistakes shall not be related to any aspect of the bidding price. Failure of the bidder to comply with the request may result in the rejection of its Bid Proposal. 26.3. Provided that a bid proposal is substantially responsive, Vietsovpetro shall rectify quantifiable nonmaterial mistakes related to the bidding price; the bidding price shall be adjusted to reflect the price of a missing or non-conforming item or component; this adjustment is for comparison purposes only.
27. Sub-contractor	27.1. Sub-contractors are organizations, individuals signing contracts with the bidders to perform related services. 27.2. Requirements of Subcontractors are specified in **BDS**. 27.3. Sub-contracting will not change the bidder's responsibilities. The bidders shall be responsible for the workload, quality, progress and other responsibilities for the parts of the contract carried out by the subcontractors. Sub-contractors' capacity and experiences shall not be considered in evaluation of the Bidder's Bid proposal. The bidder itself must comply with capacity criteria (no consideration of sub-contractors' capacity and experiences). 27.4. The bidder may sign contracts with sub-contractors according to the list of sub-contractors stated in the Bid Proposal or signing contracts with sub-contractors approved by Vietsovpetro to participate in performing the work. 27.5. The bidders is not allowed to utilize the sub-contractors to carry out the tasks other than the tasks of the subcontractors mentioned in the Bid Proposal; the replacement or addition of sub-contractors other than the list of sub-contractors prescribed in the Bid Proposal shall only be carried out when there is a valid and arpprorpiate reason and is approved by Vietsovpetro; in case sub-contractors are utilized to carry out the taks other than the tasks listed in the Bid Proposal that using a sub-contractor with a value of 10% or higher (after deducting the work part of the sub-contractor's responsibility) calculated on the contract price signed, as an act of "bid transfer".
28. Bid preferences in the selection of bidder	28.1. Rules of bid preferences: Bidders shall be granted preferential treatment when supplying goods of which costs for domestic production occupy 25% or higher. 28.2. Bid preferences are applied during evaluation process for comparing and rating Bid Proposal: Goods are eligible for bid preferences provided that bidders prove that domestic production costs account for above 25% of total price. Percentage (%) of domestic production cost of goods is calculated according to the following formula:

	D (%) = G*/G (%) Where: - G*: Domestic production cost calculated by quoted price of goods defined in the Bid Proposal which subtracts tax values and external costs, inclusive of fees and charges (if any); - G: Quoted price of goods defined in the Bid Proposal subtracting tax values; - D: Percentage (%) of domestic production cost of goods, D gains the rate of 25%, which can enable goods to receive the bid preferences as regulated in this clause. 28.3. Bid preferences calculation is specified in the **BDS**. 28.4. Bidder must declare information about the eligible types of goods for bid preferences according to Forms 15A, 15B and 15C Chapter IV that is on the basis of consideration and evaluation of bid preferences. In case bidders does not declare so, the Bidder's goods are considered not eligible for bid preferences. 28.5. In case goods do not receive bid preferences, evaluation and determination of bid preferences shall not be applied. 28.6. In case of bidders ranking equally, priority shall be given to those with: - Goods originating from the Socialist Republic of Vietnam and the Russia Federation. - Services/Jobs that employ workers from the Socialist Republic of Vietnam and the Russian Federation.
29. Bid Proposal evaluation	29.1. Vietsovpetro shall apply evaluation criteria listed in this clause and methods of evaluation are specified in the **BDS**. Any other criteria and methods of evaluation shall not be allowed. 29.2. Vietsovpetro shall evaluate directly on the bid proposals submitted by the bidder. 29.3. Verify and evaluate eligibility of Bid Proposal: a) The verification and evaluation of eligibility of Bid Proposal as specified in clause 1, Chapter III –Bid Proposal Evaluation criteria; b) Any bidders who have eligibility Bid Proposal shall be further considered and evaluated with respect to capacity and experiences. 29.4. Evaluation of capacity and experiences: a) Capacity and experiences are evaluated as specified in clause 2, Chapter III – Bid Proposal Evaluation criteria; b) Bidders with satisfactory capacity and experiences shall be considered and evaluated to examine their technical capability. 29.5. Technical and price-based evaluation: a) Evaluation of technical capability must adhere to the evaluation standards and methods prescribed in Section 3, Chapter III – Bid Proposal Evaluation criteria; b) Bidders who satisfy technical requirements shall be considered to evaluate the price specified in Section 4, Chapter III – Bid Proposal Evaluation criteria. 29.6. After price-based evaluation, Vietsovpetro shall make and approve ranking list of bidders. The bidder ranked at the first position in the bidder's ranking list shall be eligible for the contract

	negotiation. Ranking of bidders shall be made as prescribed in the **BDS**. 29.7. In case the Invitation to Bid is divided into independent parts and bidder is allowed bidding in each part prescribed in ITB 1.2, bid evaluation is carried out with those respective parts of the bidder as prescribed in Section 6, Chapter III – Bid Proposal Evaluation criteria. 29.8. Principle of Bid proposal's evaluation: a) Vietsovpetro evaluate directly based on the bid proposals submitted by the bidder. In case the information committed, declared in the Bid proposal is not truthful, leading to false results of evaluating Bid proposal of the bidder, bidder shall be considered to have committed fraudulent; b) In case there is inconsistency between information of similar contract and supporting documents proving information of such similar contract, Vietsovpetro request bidder to clarify the Bid proposal. In case the contracts declared, enclosed in the Bid proposal that not meeting the requirements of Invitation to Bid or the Bidder does not declare or incompletely declares the similar contracts, Vietsovpetro request the bidder to clarify and supplement the another contract to meet the requirements of the Invitation to Bid within an appropriate period of time but not less than 03 working days. In case the bidder does not have a contract met the requirements of the Invitation to Bid, the bidder shall be disqualified; c) In case the key personnel and key equipment (if any) proposed by the contractor in the Bid proposal not meeting the requirements, Vietsovpetro allow the bidder to supplement or replace. Bidders are only allowed to add or replace each personnel position, equipment once within an appropriate period of time but not less than 03 working days. In case the Bidder does not have the replacement of personnel and equipment that meet the requirements of the Invitation to Bid, the bidder will be disqualified. Under any circumstances, on condition that the Bidder dishonestly declares personnel and equipment, the Bidder is not allowed to substitute other personnel or equipment, the Bidder's Bid proposal shall be rejected and the Bidder shall be considered having committed fraudulent according to regulations with legislation on bidding or other relevant legislation and shall be subject to be handled according to regulations; d) For the origin of the goods, in case there is any inconsistency between the declared information and attached documents, Vietsovpetro request clarification of the Bid proposal; e) For contents other than those mentioned in Points a, b, c and d of this Clause, in case there is inconsistency between the information in the original Bid proposal and the copy of the Bid proposal, the information in the original Bid proposal is the basis for review and evaluation; f) At the financial assessment step, in case the Bidder does not declare information in the bid preferences's form for domestically produced goods (for Goods procurement bidding packages) in order that Vietsovpetro have a basis for calculating bid preferences, then Bidder will not receive the bid preferences.

30. Contract negotiation	Contract negotiation shall be stipulated in **BDS**. 30.1. Contract negotiation shall be based on the followings: a) Report on evaluation of the Bid Proposal; b) Bid Proposal and bidder's records of clarification of bidding package (if any); c) Invitation to Bid. 30.2. Principles of the contract negotiation: a) Not negotiating on the contents the bidder offered in accordance with the requirements of the Invitation to Bid; b) While evaluating Bid Proposal and negotiating contract, if realizing the scope of supply/ work, workloads specified in Chapter V – Scope of Supply are insufficient compared with the design documentation, Vietsovpetro shall request bidder to add supplement scope for this insufficient part, on the basis of the quoted price; if the Bid Proposal has not provided the unit price, Vietsovpetro shall consider and decide on applying the unit price approved estimated price for these scope of work/ inadequate workloads compared to the design documentation or the unit price quoted by other bidders who have passed the technical evaluation if this unit price is lower than the approved unit price in the estimated bidding packge; c) When negotiating a contract for the deficient deviation, if the Bidder's bid proposal does not have a unit price corresponding to the deviation, the lowest bid unit price among other bidders' bid proposals that meet the technical requirements must be taken or taking the unit price in the approved estimate if this is the only bidder who passes the technical evaluation step as a basis for negotiating that deficient deviation. 30.3. Contents of contract negotiation: a) Unspecified, inappropriate and inconsistent contents between Invitation to Bid and Bid Proposal, between different contents in the Invitation to Bid may lead to incidents, disputes or impact on the contractual obligations of contracting parties; b) Deviations that have been found by the Bidder and Bidder's recommendations (if any), including proposal of amendment or technical alternatives which Bidder is allowed to provide according to relevant bidding regulations; c) Any issue that arises during the selection of Bidder (if any) in the aim of completing detailed contents of the bidding package; d) Nonmaterial omissions specified in ITB 30; e) Other necessary issues. 30.4. During contract negotiation, negotiating parties must proceed to draft and complete the official agreement, detailed terms and conditions and annexes that determine detailed list of scope of supply, price list and progress of supply. 30.5. If the negotiation fails, Vietsovpetro shall consider, decide to invite the bidder who is ranked at the next positions for contract negotiation; if the successive negotiations also fail, Vietsovpetro shall report to the Investor to consider, decide the bidding cancellation as regulated in point a, ITB 32.1.

31. Conditions for recommendation as the awarded bidder	Bidder shall be considered for recommendation as the winning bidder upon satisfying the following conditions: 31.1. Having Eligibility Bid Proposal as prescribed in Section 1, Chapter III; 31.2. Having capacity and experiences satisfying requirements as prescribed in Section 2, Chapter III; 31.3. Having technical proposals satisfying requirements as prescribed in Section 3, Chapter III; 31.4. Having deficient deviation not exceeding 10% of bidding price; 31.5. Meeting requirements specified in the **BDS**; 31.6. The bidder has the proposed price award (including taxes, fees, charges (if any) not exceeding the approved bidding package price. If the approved estimated budget of bidding package is lower than or higher than the approved bidding package price, this estimate shall replace the bidding package price as basis for consideration for recommendation as the winning bidder.
32. Bidding cancellation	32.1. Vietsovptro shall notify the bidding cancellation in following cases: a) All Bid Proposals fail to satisfy the requirements of the Invitation to Bid; b) Change of the objectives, scope of procurement resulting in changes in volume of work and evaluation criteria stated in the Invitation to Bid at Vietsovpetro's decision; c) The Invitation to Bid fails to comply with legislation on bidding or other relevant legislation that lead to the failure of the selected bidder to meet requirements for performing bidding package; d) The award bidder commits prohibited acts specified in section 4 prohibited acts - Chapter I Instructions to Bidders; e) Organizations and individuals other than the awarded bidder commit prohibited acts specified in section 4 prohibited acts - Chapter I Instructions to Bidders leading to deviations in bidder selection results. 32.2. Organizations and individuals infringing law on bidding that lead to bidding cancellation as prescribed in point c, d, e in ITB 32.1 is undertaken to compensate expenses for related parties and be handled as prescribed by law. 32.3. In case of bidding cancellation specified in this section, Vietsovpetro shall return or release Bid Bond to bidders who has submitted the original Bid Bond within 05 working days, except the bidder violates the regulation as specified in point d and point e, ITB 32.1.
33. Notice of bidder selection result	33.1. Vietsovpetro shall publish notice of bidder selection results within 05 working days from the date of approval of bidder selection results. Notice of bidder selection result shall include following contents: a) Information of the bidding package: - Number of Invitation to Bidder; - Name of the bidding package; - Bidding package price or approved estimate (if any);

	- Name of Investor; - Form of bidder selection; - Type of contract; - Time to implement the bidding package; - Time of contract performance. b) Information of the awarded bidder: - Tax code; - Contractor name; - Bidding price; - Bidding price after discount (if any); - Technical scores (if any); - Evaluation price (if any); - Awarded bidding price; - Time to implement the bidding package. c) For each type of goods and equipment in the bidding package, the Investor must publish the following information: - Goods name; - Wattage; - Features and technical specifications; models, part numbers, labels; - Origin; - Awarded of bidding unit price. d) List of unselected bidders and brief reasons of each bidder for not being selected. 33.2. In case of bidding cancellation as prescribed in point a, ITB 32.1, in the notice of bidder selection results and on the national bidding network must be clearly stated the reason for cancellation of bidding.
34. Change in volume of goods and services	34.1. At the time of awarding contract, Vietsovpetro are entitled to increase or decrease the volume of services stated in Chapter IV provided that such change not exceeding the rate specified in the **BDS** and there is not any change in the unit price or other terms and conditions of the Bid Proposals and Invitation to Bid. The rate of increase and decrease in volume shall not exceed 10%. 34.2. Additional purchase option: Before the contract expires, the Investor has the right to purchase an additional volume of goods or services in the bidding package other than the volume stated in Chapter IV provided that not exceeding the rate specified in the **BDS**.
35. Notice of Bid Proposal acceptance and contract award	35.1. After publishing the notice of bidder selection results, Vietsovpetro send a notice of acceptance of the Bid proposals and award the contract, including requirements on measures of contract performance guarantee, completion time, and contract signing. VND according to the provisions in Form as prescribed in Part 4 for the awarded bidder. Notice of acceptance of bid proposals and contract award are part of the contract documentation. In case the awarded bidder fails to complete, sign the contract or submit the contract performance guarantee within the deadline stated in the notice of bid proposal's acceptance and contract award, the bidder

	shall be disqualified and shall not be refunded the value of Bid bond as prescribed in Section 18.5 ITB. The period of time stated in the notice of bid proposal acceptance is calculated from the date Vietsovpetro sending this acceptance notice to the awarded bidder on the nation bidding network. 35.2. The method for signing contract using electronic signatures (for Vietnamese Bidders) shall be as specified in the BDS
36. Conditions for signing contract	36.1. At time of signing contract, Bid Proposal of the selected bidder are still valid. 36.2. At time of signing contract, the selected bidder must ensure to meet requirements on technical and financial capability for implementation as prescribed in the Invitation to Bid. If the bidder no longer meets basic requirements of technical and financial capability prescribed in the Invitation to Bid, Vietsovpetro shall refuse to sign contract with the bidder. Vietsovpetro shall therefore cancel previous decision on approval of bidder selection result and contract award, and shall invite the bidder who is ranked at the next position for comparing documentation and contract negotiation (if required). 36.3. Vietsovpetro shall ensure conditions on funding for advance payment, payment funding and other necessary conditions for carrying out the bidding package on the schedule.
37. Contract performance guarantee	37.1. Before signing a contract or before the contract comes into effect, the bidder shall provide contract performance guarantee as specified in Part 3. In case of applying a form of contract performance guarantee, the form specified in Part 3 or another form approved by Vietsovpetro shall be complied. 37.2. The bidder shall not be entitled for the returning of the contract performance guarantee in the following cases: a) The bidder refuses to perform the contract after the date the contract comes into force; b) The bidder violates agreements in contract; c) Performing the contract behind schedule due to bidder's fault but refusing to extend the validity of the contract performance guarantee.
38.Handling of complaints in bidding	38.1. When bidder's legal rights and interests are affected, the bidders, agencies and organizations may file any complaint to Vietsovpetro with respect to procurement process, bidder selection result according to the regulations of Vietsovpetro. 38.2. In case of petition to Vietsovpetro, the bidder shall send the petition to the address specified in the **BDS**.
39.Monitoring, supervising of Bidder selection process	When detecting violated behavior or content inconsistent with the provisions of bidding law, the bidder is responsible for notifying the organization, individual performing the monitoring task and supervision as prescribed in the **BDS**.

Chapter II. BIDDING DATA SHEET

ITB 1.1	Name of Employer: Vietsovpetro – PC Block 04-3
ITB 1.2	Title of bidding package: **Provision of Valves, Piping, Fitting & Structure materials để lắp đặt van điều áp, Block 04-3 (Bidding package No.91-VT-1614/26-XL-TTHN)** Name of project: **Block 04-3 Project.** Quantity, reference numbers of parts under the bid package: **Vietsovpetro will make evaluation and selection by Each group.** - Group 1: Valves (Item 1÷ Item 3) - Group 2: Piping, Fitting, Flange and Structure materials(Item 4÷ Item 19) Year of production: See technical requirements attached. Scope of supply: See Attachment 01 of Part 4 Technical requirement: See Attachment 02 of Part 4 Technical evaluation criteria: See Attachment 03 of Part 4
ITB 3	The source of funding: Block 04-3.
ITB 5 (d)	Competitiveness in the bidding must be ensured by following rules: - Bidders participating in bidding do not have a shareholding or equity contribution representing more than 30% with Vietsovpetro – PC Block 04-3 / Vietsovpetro, except in the case of: (i) The bidder is an affiliate or subsidiary of a state-owned corporation or group whose main production and business lines are consistent with the nature of the bid package of that state-owned corporation or group. (ii) The bidder is a parent company, subsidiary, or affiliate of a state-owned corporation or group whose main production and business lines are suitable for products and services under the bid package, and this bid package belongs to its subsidiary or affiliate. - The bidder do not either have a shareholding or equity contribution relationship with consultants or have a shareholding or equity contribution representing more than 20% of equity owned by a third party being an entity or a natural person, specifically as follows: + Consulting on preparation for technical design: *Not applicable*; + Consulting on verification of bid price: *Not applicable*; + Consulting on supervision of contract execution and inspection: *Not applicable*; + Consulting on preparation for the ITB: *Not applicable*; + Consulting on appraisal of the ITB: *Not applicable*; + Consulting on evaluation Bid Proposal: *Not applicable*; + Consulting on appraisal of bidder selection results: *Not applicable*; + Project management consulting, contract management, other consulting services whose work is directly related to the bid package: *Not applicable*; - The bidder does not belong to the same agency or organization directly managing the consultants (mentioned above)[1].

[1] Only evaluate this content for bidders that are public sector entities.

	- Public sector entities and employers, procuring entities that have the same direct governing authority, and equity contribution when participating in bidding for each other's bid packages shall not have to satisfy the regulations on legal and financial independence between the bidder and the employer and the procuring entity. - Public sector entities and enterprises that have the same direct governing authority, and equity contribution when participating in bidding for each other's bid packages shall not have to satisfy the regulations on legal and financial independence between the bidder and the employer and the procuring entity. - The ratio of shares, equity contributions between the parties is determined at the deadline for submission of bids and according to the ratio stated in the business registration certificate, establishment decision, and other documents of equivalent value. In case the bidder participates in the bidding as a joint venture or the consultant is selected as a joint venture, the equity ownership ratio of other organizations and individuals in the joint venture is determined according to the following formula: $$\text{Ownership ratio} = \sum_{i=1}^{n} X_i \text{ x } Y_i$$ Of which: X_i: Equity ownership ratio of other organizations and individuals in the i-th joint venture member; Y_i: Percentage (%) of the work volume of the i-th joint venture member in the joint venture agreement; n: Number of members participating in the joint venture.
ITB 5 (h)	Bidder's name is registered on National bidding network before the grant of approval for contractor selection result as prescribed: - Bidders have to register procurement information on **the National bidding network**: **<u>To be applied.</u>** - Bidders are to provide confirmation of information registration on the national bidding network system in according to the Circular issued by Ministry of Planning & Investment for providing provisions on posting information about biding, on the roadmap for applying online Contractor selection, and managing the use of the value of bidding guarantee, ensuring the performance of non-refundable contracts: <u>Detailed instructions of the National bidding network system are on the website: http://muasamcong.mpi.gov.vn</u>
ITB 7.1	The amendment of Invitation to Bid shall be published in National bidding network at least **03 working days** prior to the Deadline for bid submission.
ITB 7.2	Requests for clarification should be received by Vietsovpetro at least **05 working days** prior to the Deadline for bid submissions. Vietsovpetro shall clarify the request of clarification at least **03 working days** prior to Deadline for bid submissions.
ITB 7.3	Pre-bidding conference: No.
ITB 8	Payment for the Invitation to Bid:

	Interested bidders can buy Invitation to Bid with non-refundable cost of VND 500,000.00/set (in word: Five hundred thousand Vietnam Dong/set) Payment for Invitation to Bid shall be made by Telegraphic Transfer to the following Vietsovpetro's account: Account No. 008.100.000001.1 Beneficiary: Vietsovpetro. Vietcombank, Vung Tau Branch. Please indicate: Bidder name, payment for Invitation to Bid Bidding package No.91-VT-1614/25-XL-TTHN.
ITB 10.10	The Bidder shall submit the following additional documents in its bid proposal: Scope of supply, Scope of work and Technical documentation as required in Technical requirement (Part 2 Chapter V – Scope of supply, Scope of work and Technical documents, etc. in Invitation to Bid).
ITB 12.1	Bidder is allowed to submit Technical alternative. The bidder is required to clearly state the **main offer** and the **alternative offer** in the bidding proposal. Technical alternatives are only considered when main solution meets requirements and bidder is ranked first. In this case, bidder shall provide all information necessary for evaluation of the alternatives by Vietsovpetro, including notes, drawings, technical specifications, progress of supply and other relevant information.
ITB 13.5	In the detailed price quotation table, bidder shall offer prices according to the following requirements: **For foreign bidders:** The Bidders are requested to offer price on delivery term CFR Vietsovpetro port, HoChiMinh City, S.R. Vietnam in accordance with Incoterms accompanied with appropriate amendments – if necessary as Bidding form No. 12A, Chapter IV – Bidding form and provide "Incoterms 2020". In case goods are accompanied with services, commissioning, … Bidders have to clearly state that whether the offered price includes Foreign Contractor Withholding Tax (FCWT) as Bidding form No. 13. If the offered price has not included, Vietsovpetro will calculate and add FCWT into the offered price for comparison and evaluation *(FCWT tax rate is: 1.01% for goods).* Vietsovpetro shall do necessary procedures for tax exemption of goods. **For Vietnamese Bidders:** The Bidders are requested to offer price on delivery to Vietsovpetro warehouse, HoChiMinh city, S.R. Vietnam including all taxes, fees and charges (if any) arisen inside Vietnam. Exemption of import tax for imported goods from using List of exempted goods available for Vietsovpetro in Block 04-3 is stipulated as Bidding form No. 12A and 12B, Chapter IV- Bidding form.
ITB 15.6	Expected operating duration of Goods (for the purpose of requirement of spare parts, specialized tools): Not applicable.
ITB 16.2	The documentary evidence of the Bidder's capacity to perform the contract if the bidder win the bid including:

<table>
<tr><td></td><td>Manufacturer’s License for sale or the Certificate of Partnership or similar documents: as per Technical requirement, Chapter V in Invitation to Bid.</td></tr>
<tr><td>ITB 17.1</td><td>The Bid proposal shall be valid for 90 days from the Deadline for bid submission.</td></tr>
<tr><td>ITB 18.2</td><td>Contents of Bid Bond:
The amount and currency of the Bid Bond shall be:
<table>
<tr><th>No</th><th>Group</th><th>Bid Bond value (USD)</th><th>Bid Bond value (VND)</th></tr>
<tr><td>1</td><td>Group 1: Item 1÷Item 3</td><td>831.00</td><td>21,824,000.00</td></tr>
<tr><td>2</td><td>Group 2: Item 4÷Item 19</td><td>38.00</td><td>1,006,655.00</td></tr>
<tr><td colspan="2">For 02 groups</td><td>869.00</td><td>22,830,655.00</td></tr>
</table>
If bidder attends the bid for one or more than one group, value of Bid Bond should be equal to sum of those above value with respective groups.
The Bid Bond shall be valid for 120 days from the Deadline for bid submission.
In case the Bidder provides the Bid Bond through Deposit / Telegraphic Transfer to the following Vietsovpetro’s account:
Account: 0081001135976 (VND)
0081371135977 (USD)
Beneficiary: Vietsovpetro – PC Block 04-3.
Vietcombank, Vung Tau Branch.</td></tr>
<tr><td>ITB 18.4</td><td>The Bid Bond of unsuccessful Bidders shall be returned or released in maximum 14 days from the date of Notification of Bidder selection Result.</td></tr>
<tr><td>ITB 19.1</td><td>The Deadline for bid submission at:
09h00 (local time) on _____/_____/2026</td></tr>
<tr><td>ITB 20.1</td><td>In addition to original of Technical Proposal and Financial Proposal, the quantity of copies of Technical Proposal (as per required in Technical requirement), Financial Proposal (01 copy). In case of modification, substitution of Technical Proposal, Financial Proposal or technical alternative, the bidders must submit the equal number of copies of modification, substitution or Technical alternative.
Notes:
Quantity of Proposal:
+ Technical Proposal: 01 original and 02 copies;
+ Financial Proposal: 01 original;
+ Soft copy:
01 USB included scanned Technical Proposal;
01 USB Financial Proposal and native excel file of Financial Proposal.
+ All of the Proposals shall be sealing and marking as requirement in Chapter I Point 21.</td></tr>
<tr><td>ITB 20.7 (a)</td><td>Bidders shall submit their Bid Proposals to:
Recipients: Vietsovpetro
Address: 105 Le Loi Str., Vung Tau Ward, Ho Chi Minh City, S.R. Vietnam</td></tr>
</table>

ITB 21.1	The Bid proposal shall be opened publicly: At the following address: Vietsovpetro, 105 Le Loi Str., Vung Tau Ward, Ho Chi Minh City, S.R. Vietnam Time: at **09h30 (local time) on _____/_____/2026**
ITB 23.4	Bidders themselves can provide such evidence to Vietsovpetro within 03 days from the Deadline for submission of bids.
ITB 27.2	Total value of sub-contractor(s) shall not exceed: **0%** of total value of Bid proposal. Specialized sub-contractor: Not applicable.
ITB 28.3	Calculation of preferential treatment: Goods that do not receive bid preferences must add a monetary amount accounting for 7.5% of bidding price after rectification of errors, adjustment of deviations and deduction of discounts (if any) of these goods to the bidding price after rectification of errors, adjustment of deviations and deduction of discounts (if any) of bidders for comparison and ranking.
ITB 29.1	Bid proposal evaluation methods: a. Evaluation of the bidder's capacity and experience: using Pass/Fail criteria. b. Technical evaluation: *to apply evaluation method using calculating point criteria in accordance with evaluation criteria stipulated in Section III, Chapter III, Bid Proposal Evaluation Criteria.* c. The price evaluation: *to apply lowest price method **for each group** in accordance with evaluation criteria stipulated in Section V, Chapter III, Bid Proposal Evaluation Criteria.*
ITB 29.6	Ranking of bidders: *the bidder who has the lowest price **for each group** after rectification of errors, adjustment of deviation and deduction of discounts (if any) is ranked the first.*
ITB 30	Contract negotiation: *Not applicable.*
ITB 31.5	Having lowest bidding price ***for each group*** after rectification of errors, adjustment of discrepancies, taking into account discount (if any), conversion of bidding price into a single currency, addition preferential treatment value (if any), excludes all taxes, fees and charges (if any).
ITB 34.1	The maximum percentage of work volume may be increased is: *Not applicable.* The maximum percentage of work volume may be decreased is: *Not applicable.*
ITB 34.2	Additional purchase option: *Not applicable.* The maximum of additional purchase option: *Not applicable.*
ITB 35.2	Bidder shall provide information on electronic signatures (if any) as stipulated in Bidding form No. 16, Chapter IV- Bidding form
ITB 38.2	Vietsovpetro's address: 105 Le Loi Str., Vung Tau Ward, Ho Chi Minh City, S.R. Vietnam Tel: 84 254 3839 871 Fax: 84 254 3839 857
ITB 39	Address of organization, individual in charge of supervision: Mr. Vu Mai Khanh – General Director of Vietsovpetro 105 Le Loi Str., Vung Tau Ward, Ho Chi Minh City, S.R. Vietnam Fax: 84 254 3839 857

Chapter III. BID PROPOSAL EVALUATION CRITERIA

Section 1: Verification and evaluation the eligibility of Bid Proposal

1.1 Verification the Bid Proposal:

a) Verify the number of original and copies of the bid proposal;

b) Verify the documents comprising the original Bid proposal including: administrative documents, legal documents, Bidder's capacity and experience documents, technical proposal as stipulated in Invitation to Bid, in which there are: Application for Bidding, Consortium Agreement (if any), Power of Attorney for signing Application for Bidding (if any); Bid Bond/Deposit; documentary evidence establishing the Bidder's eligibility to bid; documentary evidence Bidder's capacity and experience; technical proposal; price proposal and any other relevant documents of Bid Proposal as stipulated in ITB 10;

c) Verify the consistency of contents between the original and copies for detailed evaluation process of bidding package.

1.2 Evaluation the eligibility of Bid Proposal:

A Bid proposal is considered eligibility when it fully meets the following requirements:

a) The Bidder submits the original of Bid proposal.

b) The Application for Bidding is signed and stamped (if any) by the legitimate representative of the bidder as required by Invitation to Bid. For consortium, the Application for Bidding is signed and stamped (if any) by the legitimate representatives of each member of the consortium or the authorized leader member of the consortium sign the Application for Bidding according to responsibilities in written agreement of consortium.

c) Bidding prices in Application for Bidding must be detailed, fixed, indicated by numbers, words. Bidders are required not to propose different bidding prices or conditions that put Vietsovpetro in disadvantage.

d) The validity period of the Bid proposal must meet the requirements stipulated in ITB 17.1.

e) The Bid Bond / Deposit must satisfy all the requirements as stipulated in ITB 18.3.

f) The bidder is not named in 02 or more Bid proposals as a main bidder (independent bidder or a member of consortium) in one bidding package. In case the bidding package is divided into many independent parts, the bidder is not named in 02 or more Bid proposals as the main bidder for the parts that bidder participates.

g) For consortium, written agreement of consortium is signed and stamped (if any) by the legitimate representative of each member of the consortium and the consortium agreement must specify the detail scope of work and estimated respective percentage that each member will implement as Bidding Form 03, Chapter IV, Bidding Form.

If the scope of supply includes only one unit/one piece and no related service, bidder is not allowed to enter into a consortium; in case that Bidders is still in a consortium, agreement of consortium shall be considered invalid and Bidder shall be rejected.

h) The bidder is eligible as stipulated ITB 5.

Bidders who submit eligible bid proposals shall be considered and evaluated on their capacity and experience.

Section 2: Capacity and experience evaluation criteria

Standards of competence and experience are mandated and listed in Table No. 01 (for bidders who are Non-manufacturers of goods within the scope of the bid package) or Table No. 02 (for bidders who are manufacturers of goods within the scope of the bid package). A bidder's evaluation of competence and experience is subjected to whether it meets all standards. A subcontractor's competence and experience will not be taken into consideration when evaluating a bid proposal. The contractor itself must meet the evaluation standards of

competence and experience.

In case the currency used in similar contracts or one of the following – Investor's payment confirmation for past contracts for the supply of goods, tax declarations, documents proving the bidder's competence and experience – is not VND: in the bid proposal, the bidder must convert them to VND as a basis for evaluation. The conversion is subject to the exchange rate of Vietcombank's selling rate at the date of signing a similar contract.

In case the Bidder participating in bidding is the parent company (for example, Corporation) assigning a subsidiary to perform part of the work in the bid package, the contractor must declare specifically which part using Form 11C Chapter IV. The evaluation of experience in fulfilling similar contracts is based on the value and volume of work that the parent company and subsidiary delivered in the bidding package.

For Consortium, capacity and experience will be defined by the aggregated capacity and experience of each member of Consortium, but it must be assured that each member of Consortium must satisfy the requirement of capacity and experience for the volume of work implemented by him; if any of the members in Consortium do not satisfy the capacity and experience criteria, the Consortium will be evaluated as fail to meet the requirement on capacity and experience.

Sub-contractors' capacity and experience will not be considered in the evaluation of the Bid proposal of main Bidder (unless the Invitation to Bid allows to use specialized sub-contractor). The main bidders themselves must satisfy criteria on capacity and experience (not considered the sub-contractors' capacity and experience).

In case application of pre-qualification, if there are changes in capacity and experience when submitting the bid proposal in comparison with the information in the evaluated pre-qualification documents, the bidders must update their capacity and experience; in case there is no change in bidders' capacity and experience, the bidders must send a written commitment that they still satisfy the bidding package's requirements.

If there is no pre-qualification, the evaluation of capacity and experience will be carried out in accordance with the following evaluation criteria, the bidders are considered "pass" the capacity and experience requirements if they satisfy all the criteria.

2.1. Criteria for evaluation of capacity and experience

The evaluation of capacity and experience will be carried out as in following table:

CRITERIA TABLE FOR EVALUATION OF BIDDER'S CAPACITY AND EXPERIENCE

(For Bidders who are Non-manufacturers[(1)] of goods under the scope of the bid package)

Table No. 01

	Criteria on capacity and experience		Compliance Requirements			Documents
No.	Description	Requirement	Single Entity	Consortium		Submission Requirements
				All Members Combined	Each Member	
1.	Historical Contract Non-Performance[(1)] due to Bidder's fault	From January 01, year 2023 to Deadline for bid submission, the contractor does not have a contract for the supply of goods, not fulfilled through fault of the bidder.	Must meet requirement	not applicable	must meet requirement	Form 09
2.	Tax obligations fulfilment	Has fulfilled tax obligations of the last fiscal year before Deadline for bid submission.	Must meet requirement	not applicable	must meet requirement	Form 10

Notes:

[(1)] Non performance contracts due to Bidder's fault shall include all contracts where:

- Non performance contracts, as concluded by employer, and were not objected by the Bidder,

- Non performance, as concluded by the employer, and were so objected by the Bidder but fully settled against the Bidder by Arbitration or Court.

Non performance shall not include contracts where employer decision was overruled by the dispute resolution mechanism. Non performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract or applicable law and where all appeal instances available to the Bidder have been exhausted.

Criteria on capacity and experience			Compliance Requirements			Documents
No.	**Description**	**Requirement**	**Single Entity**	**Consortium**		**Submission Requirements**
				All Members Combined	**Each Member**	
3.	Financial Capacity					
3.1	Financial Performance	Submission of financial statements for the latest **03 fiscal years (2023-2025)** to demonstrate the current soundness of the Bidder's financial position. The Bidder's net worth for the last fiscal year to the Deadline for bid submission (calculated as the difference between total assets and total liabilities) should be positive	Must meet requirement	not applicable	must meet requirement	Form 10
3.2	Average Annual business activities Turnover (excluding VAT)	Minimum average annual turnover of following value within the latest **03** fiscal years(1) (2023-2025) (In case Company of the Bidder established less than 03 years, the value of Average annual business activity turnover will be sum total value of business activity turnover and devide to total number of years have activities)	must meet requirement	must meet requirement	not applicable	Form 10

Notes:

(1) In case of Consortium, the evaluation of the turnover criteria will be total turnover of all members for compare and evaluation.

(2) If bidder bids in one or more than one group, minimum average annual turnover within the last 03 fiscal years should be equal to sum of those below value with respective groups:

No.	Group	Description	Minimum average annual turnover value (USD)	Minimum average annual turnover value (VND)
1.	Group 1	Item 1 ÷ Item 3	75,579.00	1,984,000,000.00
2.	Group 2	Items 4 ÷ Item 19	3,486.00	91,514,000.00
	For 02 groups		**79,065.00**	**2,075,514,000.00**

(*) In case the bidder bids in one or more than one group, minimum revenue evaluation is based on the total average revenue required of those groups offered by bidder. In case the bidder bids in one group, it only needs to meet the revenue requirement of that group.

Criteria on capacity and experience			Compliance Requirements			Documents
No.	Description	Requirement	Single Entity	Consortium		Submission Requirements
				All Members Combined	Each Member	
4.	Experience on implementing Contracts of supplying similar goods	Requires **at least 01** contract for supplying of goods and equipment for the Oil and Gas industry / other industries as described hereunder that has been successfully completed(1) as main Contractor (individually or partner of Consortium) or sub-contractor (2) within the last **05 years (2021-2025)** to the Deadline for bid submission. Contract must have value equivalent to or greater than(3).	must meet requirement	must meet requirement	must meet requirement (equivalent to the volume of work implemented)	Form 07A

Notes:

(1) "Successfully completed" means completion Up to 80% of the contract value. To verify that the Similar Contract has been completed to the required extent, the Bidder shall provide.

(2) For contract implemented by bidder as member of Consortium or sub-contractor, only the amount of work implemented by Bidder itself will be considered.

(3) If bidder bids in one or more than one group, bidder's similar contracts value within the latest 05 fiscal years should be equal to those below value with respective groups:

No.	Group	Description	Minimum similar contracts value (USD)	Minimum similar contracts value (VND)
1	Group 1	Item 1 ÷ Item 3	27,712.00	727,476,000.00
2	Group 2	Items 4÷ Item 19	1,278.00	33,555,000.00

(*) In case the bidder bids one or more than one group, evaluation of similar contract is based on each respective group offered by bidder. The bidder does not have to comly with the size of total similar contract for all those groups bidder offers.

Criteria on capacity and experience			Compliance Requirements			Documents
No.	**Description**	**Requirement**	**Single Entity**	**Consortium**		**Submission Requirements**
				All Members Combined	**Each Member**	
5.	The ability of performing warranty, maintenance, repair, overhaul and provision of spare parts and other after-sale services *(To be evaluated in the Technical evaluation stage)*	The bidder must be represented by an Agent (or Representative) who is available to carry out the Bidders' obligations such as warranty, maintenance, repair and provision of spare parts by one of following: - The bidder commits its capability in fulfilling obligations of warranty, maintenance, repair, supply of spare parts or providing after-sales services as required by the Invitation to Bid. *(as per required in the Technical requirement)* - The bidder signs a principle contract with an entity capable of fulfilling the obligations of warranty, maintenance, repair, supply of spare parts or providing after-sales services as required by the Invitation to Bid. *(as per required in the Technical requirement)*	must meet requirement	must meet requirement	must meet requirement (equivalent to the volume of work implemented)	

CRITERIA TABLE FOR EVALUATION OF BIDDER'S CAPACITY AND EXPERIENCE

(For Bidders who are manufacturers[(1)] of goods under the scope of the bid package)

NOT APPLICABLE

	Criteria on capacity and experience		Compliance Requirements			Documents
No.	Description	Requirement	Single Entity	Consortium		Submission Requirements
				All Members Combined	Each Member	
1.	Historical Contract Non-Performance[(2)] due to Bidder's fault	From January 01, year …… to Deadline for bid submission, the contractor does not have a contract for the supply of goods, not fulfilled through fault of the bidder.	Must meet requirement	not applicable	must meet requirement	Form 09
2.	Tax obligations fulfilment	Has fulfilled tax obligations of the last fiscal year before Deadline for bid submission.	Must meet requirement	not applicable	must meet requirement	Form 07B

Notes:

[(1)] Manufacturer is understood as an enterprise/manufacturing facility that produces goods itself or participates in the production process of goods or a subsidiary or parent company in charge of distributing and consuming products produced by the parent company and other subsidiaries within the Group or Corporation.

[(2)] Non performance contracts due to Bidder's fault shall include all contracts where:

- Non performance contracts, as concluded by employer, and were not objected by the Bidder,

- Non performance, as concluded by the employer, and were so objected by the Bidder but fully settled against the Bidder by Arbitration or Court.

Non performance shall not include contracts where employer decision was overruled by the dispute resolution mechanism. Non performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract or applicable law and where all appeal instances available to the Bidder have been exhausted.

Criteria on capacity and experience			Compliance Requirements			Documents
No.	**Description**	**Requirement**	**Single Entity**	**Consortium**		**Submission Requirements**
				All Members Combined	**Each Member**	
3.	Financial Capacity					
3.1	Financial Performance	Submission of financial statements **03 years** (from year …… to year ……) to demonstrate the current soundness of the Bidder's financial position. The Bidder's net worth for the last fiscal year, (calculated as the difference between total assets and total liabilities) should be positive.	Must meet requirement	not applicable	must meet requirement	Form 10
3.2	Average Annual business activities Turnover	Minimum average annual turnover of following value within the latest….. fiscal years[(1)] **≥ .....USD/..... VND** (Incase Company of the Bidder established less than 03 years, the value of Average annual business activity turnover will be sum total value of business activity turnover and devide to total number of years have activities)	must meet requirement	must meet requirement	not applicable	Form 10

Notes:

[(1)] In case of Consortium, The Evaluation of the turnover criteria will be total turnover of all members for compare and evaluation.

Criteria on capacity and experience			Compliance Requirements			Documents
No.	**Description**	**Requirement**	**Single Entity**	**Consortium**		**Submission Requirements**
				All Members Combined	**Each Member**	
4.	**Capacity of goods production**	The bidder provides documents as proof of production capacity, including either: - The capacity of factories or production lines with minimum output of: .... unit/month; Or: - The highest output per month within the last 05 years prior to the Deadline for bid submission: ..... unit.	must meet requirement	must meet requirement	must meet requirement (equivalent to the volume of work implemented)	Form 07B

Notes:

In case the goods are products produced domestically by a Vietnamese bidder (which may or may not have been sold in the market), the bidder must prove that the design capacity or production quantity complies with the requirements.

In case the bidder is both a manufacturer and a supplier (some goods or a part of the volume of goods offered by the bidder in the Bid proposal which are produced by the bidder, some other goods or a part of the volume of goods are purchased by the bidder from other manufacturers or suppliers to supply for the bidding package), in addition to declaring production capacity, the bidder shall also declare experience in performing similar contracts as prescribed in Section 4 – Table No. 01 of this Chapter. The evaluation of the bidder's experience will be done on the basis of providing the similar contract for supply of goods (in response to the part of goods bidder purchases from other manufacturers or suppliers) and the bidder's production capacity (in response to the part of goods that the bidder produces itself providing in the bidding package). Bidder may use documents such as sales invoices, inventory quantities, ... to prove the quantity produced in 01 month.

Criteria on capacity and experience			Compliance Requirements			Documents
No.	Description	Requirement	Single Entity	Consortium		Submission Requirements
				All Members Combined	Each Member	
5.	The ability of performing warranty, maintenance, repair, overhaul and provision of spare parts and other after-sale services *(To be evaluated in the Technical evaluation stage)*	The bidder must be represented by an Agent (or Representative) who is available to carry out the Bidders' obligations such as warranty, maintenance, repair and provision of spare parts by one of following: - The bidder commits its capability in fulfilling obligations of warranty, maintenance, repair, supply of spare parts or providing after-sales services as required by the Invitation to Bid. *(as per required in the Technical requirement)* - The bidder signs a principle contract with an entity capable of fulfilling the obligations of warranty, maintenance, repair, supply of spare parts or providing after-sales services as required by the Invitation to Bid. *(as per required in the Technical requirement)*	must meet requirement	must meet requirement	must meet requirement (equivalent to the volume of work implemented)	

2.2. Evaluation Criteria for Key personnel *(Not applicable*)

2.3. Sub-contractors and Specialized Sub-contractors *(Not applicable*)

Section 3: Technical evaluation criteria (see Part 2 – Chapter V)

Section 4: Price evaluation criteria (Lowest price method)

Determination of lowest price as following steps:

Step 1: Determination of bidding price not including all taxes, fees, charges (if any) arisen inside Vietnam;

Step 2: Rectification of errors (apply in accordance with Note (1));

Step 3: Adjustment of deviations (apply in accordance with Note (2));

Step 4: Determination of bidding price after rectification of errors, adjustment of deviations, discount deduction (if any);

Step 5: Conversion of bidding price into a single currency (if any);

Step 6: Determination of preferential treatment value (if any) as stipulated in ITB 28;

Step 7: Ranking the bidders: the Bid proposal which has the **lowest bidding price for the each group** after rectification of errors, adjustment of deviations, discount deduction (if any), conversion of bidding price into a single currency, addition preferential treatment value (if any), excluding all taxes, fees, charges (if any) arisen inside Vietnam shall be ranked the first.

The following content will be considered in the evaluation and ranking stage of contractors:

During the Bid evaluation stage, for proposal of goods originating from countries affected by armed conflict, in state of war, sanctioned or embargoed, and the importation of those may be interrupted and affect the contract performance and delivery schedule, Bidder must provide explanations and committions on the ability to deliver goods for Vietsovpetro to consider and evaluate.

Based on the actual situation at that time, Vietsovpetro has the sole and exclusive right to review and decide to reject the bids, or not to continue the evaluation, if in the opinion of Vietsovpetro there is any risk to the contract performance and delivery schedule. In that case, the Vietsovpetro at its sole and absolute discretion will have the right to consider and remove these Bidders from the ranking list.

Notes:

(1) Rectification of errors

Provided that the bid proposal substantially satisfies Invitation to Bid, Vietsovpetro shall rectify arithmetical errors and other errors on the following basis:

a) Arithmetical errors include mistakes from calculation such as: addition, subtraction, multiplication, division when calculating bidding price. If there is a discrepancy between the unit price and the total price, the unit price shall prevail and the total price shall be corrected; If there is unusual differences in unit price due to decimal errors (10 times, 100 times, 1000 times), the total price should be used as a legal basis for correction; when the bidder fills without price or "0" in the column of unit price and total price, price of this item shall be deemed to be allocated among the prices for the other items of work of the package and Bidder will not be paid for by Vietsovpetro during contract performance.

b) Other errors:

- If the Total price column is filled without the corresponding unit price, the unit price shall be determined by dividing the total price by the quantity; if the unit price is filled in, but the total price is missing, the total price shall be determined by multiplying the quantity by the unit price; if one of the items has the unit price and total price filled in, but the quantity is missing, the quantity shall be determined by dividing the total price by the unit price of that particular item. In case the aforesaid quantity that has been additionally defined is different from the quantity mentioned in the Invitation to Bid, that value difference is the deviation in the scope of supply, which shall be adjusted under regulations specified in Step 3;

- Mistake in Unit must be corrected to meet the requirements specified in the Invitation to Bid;

- Mistakes in using comas (instead of periods) and vice versa shall also be corrected in accordance with the written in Vietnamese customary. If Vietsovpetro determines the obvious mistake in placing of comas and periods, the total price shall prevail and the unit price shall be corrected.

- If there is an error in a total corresponding to the addition of subtotals, the subtotals shall prevail and the total shall be corrected;

- If there is a discrepancy between words and numbers, the amount in words shall used as a legal basis for correction. If the amount expressed in words is incorrect, then the number after rectification of error as stipulated in this article should be used as a legal basis for correction.

(2)Adjustment of deviation

a) In case of deviation in the scope of supply compared to the Invitation to Bid, what is deficient shall be added, and what is redundant shall be subtracted according to respective unit price in the Bid proposal of bidder that has deviation;

In case of deficient deviation (lack of items of work in comparison with the scope of supply, lack of inland transportation cost to Vietsovpetro warehouse / Vietsovpetro port in case Bidder does not offer delivery term to Vietsovpetro warehouse / Vietsovpetro port), if there is no respective unit price in the Bid proposal with deficient deviation, the adjustment of deviation will be as follows:

- <u>Lack of items of work in comparison with the scope of supply:</u>

The highest unit price offered for such item of Bid proposals which pass the Technical evaluation shall be used as legal basis for adjustment of deviation. In case the Bid proposals passed the Technical evaluation has no unit price, unit price in the value of bidding package shall be used as legal basis for adjustment of deviation. In case not having value of bidding package, unit price for calculating price of bidding package shall be used as legal basis for adjustment of deviation.

In case only one bidder passes the Technical evaluation, adjustment of deviation shall be made based on respective unit price in the Bid proposal of this bidder; In case this Bid proposal has no respective unit price, unit price in value of bidding package shall be used. In case not having value of bidding package, unit price for calculating price of the bidding package shall be used as legal basis for adjustment of deviation.

- <u>Lack of inland transportation cost to Vietsovpetro warehouse / Vietsovpetro port:</u>

In case Bidder does not offer delivery term to Vietsovpetro warehouse/ Vietsovpetro port and not having value/ unit price for inland transportation cost to Vietsovpetro warehouse/ Vietsovpetro port, unit price in the value of bidding package shall be used as legal basis for adjustment of deviation. In case of not having unit price in the value of bidding package, the following rates shall be used as legal basis for adjustment of deviation*:*

* For [goods such as pipes and metal]: The inland transportation cost = 10.66 USD/ton

* For [other goods]: The inland transportation cost = 0.25% x Total proposed bid price.

b) In case bidder has discount letter, rectification of errors and adjustment of deviation shall be made based on bidding price without discount. Percentage (%) of deficient deviation shall be determined on basis of comparison of bidding price in Application for Bidding.

Section 5: Technical alternative (If applicable).

Bidder is allowed to submit Technical alternative and requested to identify clearly which is "**The Main offer**" and which is "**The alternative offer**" in the Proposal.

Note: Technical alternatives are only considered when main solution meets requirements and bidder is ranked first. In this case, bidder shall provide all information necessary for evaluation of the alternatives by Vietsovpetro, including notes, drawings, technical specifications, progress of supply and other relevant information.

Section 6: Bidding package with multiple independent parts *(Not applicable)*.

If the bidding package is divided into multiple independent parts as stipulated in ITB 1.2, implement as follows:

1. The evaluation and approval of the winning of bid will be carried out on the basis that the total proposed bid winning prices of the bidding package are lowest (for lowest price method); the total evaluated prices are lowest (for evaluated price method); the total proposed bid winning prices shall not exceed the approved value of bidding package but are not compared to the estimated value of each part.

2. There is one contract if only one bidder wins all the parts of the bidding package. There are many contracts if many bidders win the different parts of the bidding package.

Section 7: The right to unilaterally terminate contract negotiations with the first-ranked contractor in in contract negotiation satge.

For the proposal of goods originating from countries affected by armed conflict, in state of war, sanctioned or embargoed, and the importation of the those may be interupted and affect the contract performance and delivery schedule, explanations and commitments on the ability to deliver goods must be provided by the Bidder for Vietsovpetro to consider and evaluate.

Based on the actual situation at that time, Vietsovpetro will have the sole and exclusive right to review and decide to reject the proposals of those goods, or not to continue the evaluation, if in the opinion of Vietsovpetro there is any risk to the contract performance and delivery schedule. In that case, Vietsovpetro at its sole and absolute discretion will have the right to stop contract negotiation, and the next ranked bidder will be invited to negotiate the contract.

Chapter IV. BIDDING FORMS

No.	Bidding Form	Performance	Responsibility for performance	
			Vietsovpetro	Bidder
1.	Form 01. Application for bidding form	Submission with Bid Proposal		X
2.	Form 02. Power of Attorney			X
3.	Form 03. Consortium Agreement			X
4.	Form 04A. Guarantee for Bid Participation *(Bid Bond), applicable to independent bidders*			X
5.	Form 04B. Guarantee for Bid Participation *(Bid Bond), applicable to consortium bidders*			X
6.	Form 04C. Form of Deposit for bid participation	Submission with Bid Proposal		X
7.	Form 05. Bidder's information form			X
8.	Form 06. Information form for consortium bidders			X
9.	Form 07A. Similar contract performed by bidder *(applicable to commercial bidders)*			X
10.	Form 07B. Declaration of goods production capacity *(applicable to bidders who are manufacturers)*			X
11.	Form 08A. Proposed Key Personnel			
12.	Form 08B. Profession skill curriculum vitae of key personnel			
13.	Form 08C. Professional Experience			
14.	Form 09. Historical Contract Non-Performance for the supply of goods due to fault of the bidder in the past.			X
15.	Form 10. Bidder's Financial Status			X
16.	Form 11A. Scope of work using sub-contractors			
17.	Form 11B. List of specialized sub-contractors			
18.	Form 11C. List of subsidiaries and member companies delivering work in the bidding package			
19.	Form 12. Summary of bidding prices			X
20.	Form 12A. Bidding price schedule of goods *(manufactured, processed outside Vietnam)*			X
21.	Form 12B. Bidding price schedule of goods *(domestically manufactured, processed or goods manufactured,*			X

No.	Bidding Form	Performance	Responsibility for performance	
			Vietsovpetro	Bidder
	processed outside Vietnam but already imported and being offered in Vietnam)			
22.	Form 13. Bidding price schedule for related services			X
23.	Form 14A. Spare parts for replacement (*Optional Scope) for Goods manufactured, processed outside Vietnam)*			X
24.	Form 14B. Spare parts for replacement *(Optional Scopre) for Goods domestically manufactured, processed or goods manufactured, processed outside Vietnam, but already imported and being offered in Vietnam*			X
25.	Form 15A. Declaration of goods with bid preferential treatments			X
26.	Form 15B. Costs of goods manufactured domestically with bid preferential treatments *(in case of declaration for cost of import)*			X
27.	Form 15C. Costs of goods manufactured domestically with bid preferential treatments *(in case of declaration for cost of manufacturing in Vietnam)*			X

Form 01

APPLICATION FOR BIDDING[1]

Date: …… *(Date of signing application for bidding)*

Name of bidding package: …… *(Name Package according to Bid Announcement)*

Name of project: …… *(Name project)*

Bid invitation No.: *……(In case of limited tendering)*

Attention to: _____ *(full name and address of Vietsovpetro)*

After studying the Invitation to Bid and the documents for amendment of the Invitation to Bid [*insert the code of the amendment documents, if any]* that we have received, we *[insert the name of the bidder*] commit to execute [*name of Bidding package*] as required by the Invitation to Bid at the total amount of [*specify in number, in words, and currency of bid proposal*][2] and the summary of bidding price.

In addition, we voluntarily offer a discount with amount: _____ *[specify in number, in words, and currency of bid proposal]*.

The bidding price after application of discount is: _____ *[specify in number, in words, and currency of bid proposal]*[3].

Validity of the Proposal[4]: ____ [*write the validity period from the deadline for submission of bids in accordance with the BDS]* days, from the deadline for submission of bids.

Bid Security: ___ *[State the value in figures, in words and in currency of the bid security]*.

Validity of Bid Security: ____ *[insert validity period from deadline for submission of bids]*.

Time for contract implementation: …… (*Total time to perform all work required in Bidding package*)[5].

We commit:

1. We are not in the process of carrying out dissolution procedures or having its business registration certificate, cooperative registration certificate, cooperative union registration certificate, or cooperative group registration certificate revoked, not in a case of insolvency according to the provisions of the law on bankruptcy (not in the process of ceasing operations or having its business household registration certificate revoked for Bidders that are household businesses).
2. We do not violate regulations on ensuring fair competition in bidding.
3. We have fulfilled the tax liabilities of the most recent fiscal year prior to the deadline for submission of bids.
4. We are not being under suspension from participating in bidding according to the provisions of the law on bidding.
5. We are not being prosecuted for criminal liability (the household owner is not being prosecuted for criminal liability in case the bidder is a business household).
6. We do not proceed any practices of corruption, bribe, collusion, obstruction and other violated provisions of the law on procurement when participating this package.
7. The information declared in the bid is truthful.
8. In case of winning the bid, the Proposal and clarification, supplemental documents of the Proposal constitute the agreement of responsibilities between the two parties until the contract is signed.
9. If our bid is accepted, we shall furnish a performance security as specified in ITB 37.1 of the Bidding document.

Legal representative of bidder

(Name, position, signature and stamp)

Notes:

[1] Application for bidding must be filled with sufficient and accurate information of Vietsovpetro, Bidder, the validity duration of Bid proposal, signed and stamped by legitimate representative of the bidder.

[2] Bidding prices in Application for bidding must be specific, fixed, indicated by numbers, words and in accordance with total bidding prices mentioned in price list. Bidders are required not to propose different bidding prices or conditions that put Vietsovpetro in disadvantage. In case of multiple parts, the Bidder must write the total bidding price of each parts and total bidding price of all parts that bidder participates.

[3] Specify discount for the whole bidding package or for one or many works, items (specify detailed discounted works, items).

[4] The validity of Bid proposal shall be counted from the date of Deadline for bid submission to the last date of validity period as stipulated in the Invitation to Bid. From the time of Deadline for bid submission until 24:00 of the date which has the deadline for bid submission is considered as one day.

[5] Duration of contract implementation in Application for bidding must be in accordance with Technical proposal and completion schedule specified in the Bid Proposal.

[6] If legitimate representative of bidder authorizes the subordinate to sign the application for bidding, the bidder must submit Power of Attorney according to Form 02 of this Chapter; if the company's Charter/regulations or other related documents have the assignment of responsibilities to subordinates to sign application for bidding, the bid proposal must include these documents (no Power of Attorney is required in accordance with Form 02 of this Chapter).

For consortium, the application for bidding must be signed by the legitimate representative of each member of the consortium, except in Consortium agreement (as in Form 03 of this chapter), the members of Consortium agree to authorize the leader member of the consortium to sign the Application for bidding. If each member of consortium has its own authorization, apply as for independent bidders. If the bidder wins the bidding package, the bidder must present to the Employer the notarized/certified copy of these documents before signing the contract. If the information declared is not accurate, the bidder is considered violation of ITB 4.

Form 02

POWER OF ATTORNEY[1]

Date _____/_____/20_____ at (*name of place*) ……:

I, ... [*insert Name, ID/passport number, position of Legitimate representative of the bidder*], the Legitimate representative of _____ [*insert the bidder name*] at _____ [*insert address*]

To issue this Power of Attorney to:

Mr/Mrs _____

ID/Passport number _____

Position _____

To do, execute and perform the following acts and things during the process of participating the Bidding package _____ (*Name of Bidding Package*) of Project _____ (Name of project) held by Vietsovpetro:

[- Sign the Application for bidding form;

- Sign the Consortium agreement (if any);

- Sign all documents, correspondences to Vietsovpetro during the bidding process, including the written requests to clarify Invitation to Bid, written clarification of Bid proposal, or written requests to withdraw, modify or substitute the bid proposal;

- Negotiate and finalize contract with Vietsovpetro;

- Sign the Bidder's arising claims (if any);

- Sign contract with Vietsovpetro (if awarded the Bidding package)][2];

The Attorney shall lawfully perform acts within the scope of Power of Attorney as the legitimate representative of _____ (*name of bidder*).

The Mandator, [*name of Legitimate representative of the bidder*] will be completely responsible for acts performed by the Attorney, _____ [*name of the Attorney*] in the scope of Power of Attorney.

This Power of Attorney is valid for the period from _____ to _____[3] and will be made in ____ originals, _____ of which will be retained by Mandator; _____ of which will be retained by Attorney and the rest will be retained by Vietsovpetro. All original copies hereof are identical and legally equal.

Attorney	Mandator
(*Signature*)	(*Signature*)
(Name, position and stamp (if any))	*(Name, position and stamp (if any) of Legitimate representative of the bidder)*

Notes:

[1] The original of this Power of Attorney must be submitted to Vietsovpetro together with the application for bidding as stipulated in ITB 20.3. Legitimate representative of bidder gives the power of attorney to the deputy, subordinate, branch's manager, chief of bidder's representative office to perform one or more above mentioned listed acts. The stamp used in case of power of attorney can belong to the bidder or to the entity of Attorney. The Attorney can not subsequently give this authorization to another.

[2] The scope of Power of Attorney may include one or more above mentioned listed acts.

[3] Specify the date the power of attorney come into force and expiry date, in accordance with the bidding process.

Form 03

CONSORTIUM AGREEMENT[1]

_____, day ___ month ___ year _____

Bidding package: _____ [*name of bidding package*]

Under the project: _____ [*name of project*]

Based on the Invitation to Bid _____ [*name of bidding package*] date ___ month ___ year _____ [*date recorded on the Invitation to Bid*]

We, the representatives of the parties sign the Consortium Agreement, including:

Names of Consortium members _____ [*name of each consortium member*]

Represented by Mr./Ms.: _____

Position: _____

Address: _____

Tel: _____

Fax: _____

E-mail: _____

Account: _____

Tax code: _____

Power of Attorney No. ____ date ___ month ___ year _____ (*in case of authorization*).

The parties (hereinafter referred to as members) agreed to sign this Consortium Agreement with the following contents:

Article 1. General principles

1. The members voluntarily establish a Consortium to participate in the bidding package _____ [*name of bidding package*] under the project _____ [*name the project*].

2. The members agree the name of the Consortium for any transactions related to this package as: _____ [*name of the Consortium as Agreement*].

3. The members commit that there is not any member to arbitrarily join independently in this bidding package or join consortium with other members to participate in this bidding package. In case of winning the bid, all members of the Consortium shall sign the Contract and there is not any member to have the right to refuse performance of the responsibilities and obligations stipulated in the Agreement. In case a member of the Consortium refuses to fulfill their own responsibilities as agreed or violates the provisions of the signed contract, such member shall be handled as follows:

- Compensating for damages to the parties in the consortium;
- Working with members of the Consortium to compensate for all damages to the Vietsovpetro in accordance with the provisions stipulated in the Contract (corresponding to the proportion of each member specified in Article 2 of this Agreement);
- Other forms of handling ____ *[Specify other forms of handling]*.

Article 2. Assignment of responsibilities

Consortium members agree to assign responsibilities for implementation of the bidding package _____ [*write name of bidding package*] under the project _____ [*write name of project*], for each member as follows:

1. Leader of the consortium:

The parties agree to authorize to _____ [*Write name of a party*] as a leader of the consortium, representing the Consortium in the following part of work[2]:

- Signing the application of bidding;

- Signing all documents, correspondences to Vietsovpetro during the bidding process, including the written requests to clarify Invitation to Bid, written clarification of Bid proposal, or written requests to withdraw, modify or substitute the bid proposal;

- Performing Bid Bond on behalf of Consortium;

- Participating in the process of negotiation and finalization of the Contract;

- Performing Performance Bond for the entire Consortium in case the Consortium wins the bid;
- Signing the Bidder's arising claims (if any);

- Performing all obligations of the Consortium which are not specified in the Table of Responsibility between the Consortium members in item 2 as follows;
- Performing other works except for signing Contract _____ [specify the detail content of other jobs (if any)].

2. The members of the Consortium agree to assign the responsibility of members as following table[3]:

No.	**Name**	**Content of assigned work**	**Respective percentage to total bidding price**	**Amount by percentage to total bidding price**
(1)	*(2)*	*(3)*	*(4)*	*(5)*
1.	Name of the first member (Leader of the Consortium)	- Work 1:_____ - Work 2:_____ - Work 3:_____ ……..	_____%	____ VND/USD
2.	Name of the second member	- Work 1:_____ - Work 2:_____ - Work 3 _____	_____%	____ VND/USD
....	.....	....		
Total		**All work of bidding package**	**100%**	**____ VND/USD**

3. The payment method for the Consortium in case of winning the bid and signing a contract with Vietsovpetro – PC Block 04-3 is as follows:

- Vietsovpetro – PC Block 04-3 shall make direct payment to each member of the Consortium in accordance with the payment schedule specified in the Contract with the distributed amount corresponding to the proportion of workload agreed by the Consortium members and shown in column (4) of the Table of Responsibility in item 2 of this Consortium Agreement.

- Each member of the Consortium shall issue a Legal Invoice in accordance with the amount of the work performed by such Consortium member pursuant to the progress of each payment specified in the Contract.

Article 3. Validity of Consortium Agreement

1. This Consortium Agreement valid from its signing date.

2. This Consortium Agreement shall be determined to be invalid in the following cases:

- In case the Consortium wins the bid, this Consortium Agreement is an integral part of the contract signed with the Investor …and shall only be terminated when the parties fulfill their responsibilities and obligations and complete the liquidation of the contract;

- The parties agree to terminate;

- The Consortium does not win the bid;

- Cancellation of bidding package under the project as notified by the Vietsovpetro.

Consortium Agreement is made in ____ copies, each party keeps ____ copy, each having equal legal force and authenticity.

LEGAL REPRESENTATIVE OF CONSORTIUM LEADER
[Full name, title, signature and stamp]

LEGAL REPRESENTATIVE OF CONSORTIUM MEMBERS
[Full name of each member, title, signature and stamp]

Notes:

[1] *Depending on the size and nature of bidding package, the content of agreement as in this form can be amended appropriately. If the bidding package is divided into multiple independent parts, the consortium agreement must specify clearly the name, reference number of parts that the consortium participates, specify mutual responsibility and separate responsibility of each member in accordance with respective parts that bidder participates.*

[2] *The scope of authorization may include one or more above mentioned listed acts.*

[3] *Bidder must specify the detail work and the estimated percentage of respective value that each member will implement, mutual responsibility and separate responsibility of each member, including head member of the Consortium.*

Form 04A

GUARANTEE FOR BID PARTICIPATION[1]

(BID BOND)

(Applicable to independent bidder)

Beneficiary: VIETSOVPETRO – PC BLOCK 04-3
105 LE LOI STR, VUNG TAU WARD, HOCHIMINH CITY, S.R. VIETNAM.
(Hereinafter referred to as the employer)

Date: _____ *[Insert date of issue]*

BID GUARANTEE No.: _____ *[Insert guarantee reference number]*

Guarantor: _____ *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that …… *[insert name of the Bidder.]* (hereinafter called "the Applicant") will participate bid for execution of the bidding package ____ *[name of the bidding package]* under project ____ *[name of the project]* according to Bid Invitation Letter No/Bid Announcement No. ____. *[insert No. of Bid Invitation letter/ Bid Announcement No]*.

We [*name of the bank]*, hereinafter referred to as "the bank", pledge Beneficiary to guarantee for the bidder to participate in bidding for this bidding package with an amount of [*specify the value in number, in words, and the currency in use]*.

This guarantee is effective for ……[2].days, from the date……month…..year[3]

At the request of the Applicant, we, as Guarantor, hereby unconditionally and irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures, insert amount in words]* within 05 working days upon our receipt of written notice from Beneficiary stating without requiring proof that bidder violates the regulations as follows:

1. Bidder has withdrawn its Bid proposal after Deadline for bid submission and during the validity period of bid proposal;
2. Bidder violating Law on Bidding leads to cancellation of Bid in accordance with Point d, ITB 32.1;
3. Bidder fails or refuses to conduct contract negotiations within 07 days from the date receipt of notification for negotiation of contracts by Vietsovpetro; or Bidder conducts contract negotiations but withdraws its Bid proposal leading to failed contract negotiations, except for force majeure;
4. Bidder fails or refuses to conduct contract finalization within 20 days from the receipt date of Bid Award Notification from Vietsovpetro or bidder finalized contract but refuses to sign contract, except for force majeure; or the bidder refuses to sign the contract within ten (10) days from the date of completion of the contract, except in cases of force majeure;
5. Bidder does not conduct performance bond in accordance with ITB 37.

The said guarantee amount shall be paid by Guarantor forthwith to Beneficiary notwithstanding any contestation or protest by Guarantor or Applicant or by any third party, and irrespective of whether or not there is any dispute between Applicant and Beneficiary in respect of or relating to the Bidding package or in respect of any other matter and irrespective of whether or not such said dispute, if any, has been settled, resolved, litigated, or adjudicated upon otherwise howsoever.

If Applicant is selected as successful bidder: This guarantee will expire immediately if the Applicant signs contract and submit Performance Bond to Beneficiary in accordance with agreement in contract.

If Applicant is not selected as successful bidder: This Guarantee will expire immediately after we receive a copy of the Beneficiary's notification to the Applicant about the result of the Bidder selection; within 30 days after the validity period of bid proposal.

Any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

Legitimate representative of the bank

(Specify name, title, sign and stamp)

Notes:

[1] *Apply if Bid Guarantee is in form of Letter of Guarantee from financial institution or foreign bank's branches which is legally operating in Vietnam.*

[2] *Insert as stipulated in BDS 18.2.*

[3] *Insert Deadline for bid submission as stipulated in BDS 19.1.*

Form 04B

GUARANTEE FOR BID PARTICIPATION[1]

(BID BOND)

(Applicable to consortium bidders)

Beneficiary: VIETSOVPETRO – PC BLOCK 04-3
105 LE LOI STR, VUNG TAU WARD, HOCHIMINH CITY, S.R. VIETNAM
(Hereinafter referred to as the employer)

Date: _____ *[Insert date of issue]*

BID GUARANTEE No.: _____ *[Insert guarantee reference number]*

Guarantor: _____ *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that …… *[insert name of the Bidder]*[2] (hereinafter called "the Applicant") will participate bid for execution of the bidding package _____ *[name of the bidding package]* under project *[name of the project]* according to Bid Invitation letter No. ___ *[name No. of Bid Invitation letter]*.

We [*name of the bank]*, hereinafter referred to as "the bank", pledge Beneficiary to guarantee for the bidder to participate in bidding for this bidding package with an amount of [*specify the value in number, in words, and the currency in use]*.

This guarantee is effective for ……[3].days, from the date …… month … year[4]

At the request of the Applicant, we as Guarantor, hereby unconditionally and irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ *[insert amount in figures, insert amount in words]* within 05 working days upon our receipt of written notice from Beneficiary stating without requiring proof that bidder violates the regulations as follows:

1) Bidder has withdrawn its Bid proposal after bid submission deadline and during the validity period of bid proposal;
2) Bidder violating Law on Bidding leads to cancellation of Bid in accordance with Point d, ITB 32.1;
3) Bidder fails or refuses to conduct contract negotiations within 07 days from the date receipt of notification for negotiation of contracts by Vietsovpetro; or Bidder conducts contract negotiations but withdraws its Bid proposal leading to failed contract negotiations, except for force majeure;
4) Bidder fails or refuses to conduct contract finalization within 20 days from the receipt date of Bid Award Notification from Vietsovpetro or bidder finalized contract but refuses to sign contract, except for force majeure; or the bidder refuses to sign the contract within ten (10) days from the date of completion of the contract, except in cases of force majeure;
5) Bidder does not conduct performance bond in accordance with ITB 37.

If any member of consortium ___ *[insert name of consortium]* violates the Law, that leads to the Bid Bond not to be returned as specified in Point b, ITB 18.5 of Invitation to Bid, then the Bid Bond of all consortium members shall not be returned.

The said guarantee amount shall be paid by Guarantor forthwith to Beneficiary notwithstanding any contestation or protest by Guarantor or Applicant or by any third party, and irrespective of whether or not there is any dispute between Applicant and Beneficiary in respect of or relating to the Bidding package or in respect of any other matter and irrespective of whether or not such said dispute, if any, has been settled, resolved, litigated, or adjudicated upon otherwise howsoever.

This guarantee will expire: (a) if the Applicant is the successful Bidder, upon our receipt of copies of the contract agreement signed by the Applicant and the performance security issued to the Beneficiary upon the instruction of the Applicant; or (b) if the Applicant is not the

successful Bidder, upon the earlier of our receipt of a copy of the Beneficiary's notification to the Applicant of the name of the successful bidder within 30 days after the expiration of Bid Proposal.

Any demand for payment under this Bid Bond must be received by us at the office on or before that date.

Legitimate representative of the bank

(Specify name, title, sign and stamp)

Notes:

[1] Applying in case the bid security (bank security) is a letter of guarantee of credit institutions or foreign banks' branches which are established under Vietnamese law. The bank is recommended to use this Bid security (bid bond) form, in case of applying for other different forms that violates one of following regulations: bid security has lower value than required, the validity period of bid security is shorter than regulation prescribed in ITB 18.2, invalid name of Beneficiary, not original and without valid signature or with the disadvantageous conditions to Vietsovpetro, bid security shall be invalid.

[2] Bidders'name can be one of following cases:

- Name of consortium participates in bid, for instance consortium bidder A + B participates in bid, name of bidders shall be written "Consortium bidder A + B";

- Name of the member undertakes implementation of bid security for the entire consortium or for other partners in consortium, for instance consortium A + B + C participates in bid, case of the consortium agreement appointed bidder A performing bid security for whole consortium, the name of bidder shall be "Bidder A (on behalf of consortium bidder A + B + C), in case the consortium agreement appointed bidder B performing bid security for bidder B and C, then name of bidder shall be written as "Bidder B (for the behalf of bidder B and C)";

- Name of consortium's member perform separate the bid security;

[3] Insert as prescribed in BDS 18.2.

[4] Insert date deadline for bid submission in accordance with BDS 19.1.

Form 04C

FORM OF DEPOSIT FOR BID PARTICIPATION

Date: …… (*Date of signing application for bidding*)

Name of bidding package: …… (*Name Package according to Bid Announcement*)

Name of project: …… (*Name project*)

Bid invitation No.: …… (*In case of limited tendering*)

Attention to: _____ (*full name and address of employer*)

With reference to the above mentioned bidding package, we *[insert the name of the bidder*] hereby would like to confirm as follows:

1. In lieu of the submission of Bid Bond issued by a bank, *[insert the name of the bidder*] shall implement bid guarantee for [*name of bidding package*] in the form of transfer to Vietsovpetro – PC Block 04-3's bank account a deposit amount equivalent to the Bid Bond amount specified in the ITB, i.e [*specify in number, in words, and currency of deposit*]
2. Bidder confirm that Bidder shall comply all conditions as stipulated in Bid bond form of ITB. (*In the event that Bidder confirms not to comply all conditions in the Bid bond's form in ITB, Bidder's bidding proposal shall not be evaluated)*
3. After [*insert the required bid bond validity period*] days from the bid closing date ……, Vietsovpetro – PC Block 04-3 shall transfer deposit amount above to *[insert the name of the bidder*]'s account. *[insert the name of the bidder*] shall be responsible for all the bank fees in connection with this transfer.
4. Vietsovpetro's bank account:

   Beneficiary's name: Vietsovpetro – PC Block 04-3

   Beneficiary's Bank: Joint Stock Commercial Bank for Foreign Trade of Vietnam – Vungtau Branch

   Account Number: 0081001135976 (VND)
   0081371135977 (USD)

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

Along with this letter, bidder must enclose the Payment order or appropriate document evidencing that bidder executed the payment to Vietsovpetro account.

Form 05

BIDDER'S INFORMATION FORM[1]

Date: _____

NCB No. and title: _____

Bidder's name: ____ *[specify Bidder's name]*

In case of consortium, insert name of each partner in consortium

Place of business registration: _____ *(indicate province/city of Constitution)*

Year of business founding / incorporation __ *[year of company founding]*

Bidder's legal address *(in country of registration)*

Bidder's legitimate representative information:

Name:

Address:

Telephone/fax numbers:

E-mail address:

a. Attached are copies of original documents: Articles of Incorporation, Business Registration, Decision of Establishment or equivalent documents of constitution or association issued by authority of country where Bidder is operating.
b. Included the organizational chart.

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

[1] *In case of consortium Bidder, each consortium member must declare this form.*

Form 06

INFORMATION FORM FOR CONSORTIUM BIDDER's MEMBERS[1]

Date: _____

Bid package No. and titles: ____

Consortium Bidder's name:

Consortium member's name:

Consortium member's country of registration:

Consortium member's year of foundation:

Consortium member's legal address in country of registration:

Consortium member's legitimate representative information:

Name:

Address:

Telephone/fax numbers:

E-mail address:

1. Attached are copies of original documents of: Business Registration of Company, Certificate of Investment, Decision of Establishment, etc.
2. Included is the organizational chart.

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

[1] *In case of consortium Bidder, each consortium member must declare this form.*

Form 07A

SIMILAR CONTRACT PERFORMED BY BIDDER[1]

(Applicable to commercial bidders)

Date __ month __ year __

Bidder's name: ____ *[full name of bidder]*

Descriptions of each contract should contain following information:

Name and contract number	*[Full contract name and number]*		
Contract signing date	*[Date, month, year]*		
Completion date	*[Date, month, year]*		
Contract Value(3)	*[Total signed contract value and the original currency]*		Equivalent to ____ VND
If the bidder is a consortium member, provide a summary of the work undertaken and its value	*[Summary of the work]*	*[Value of the work undertaken (amount in original currency and %]*	Equivalent to ___ VND
Project or Procurement name	*[Full name of the project/procurement estimate whose contract is being declared]*		
Name of Investor:	*[Full name of the Investor in the contract being declared]*		
Address: Telephone/fax: Email:	*[Full current address of the Investor]* *[Phone number, fax number including country code, area code]* *[Email address]*		
Describe similarities in accordance with Section 2.1 of Chapter III[2]			
1. Type of goods	*[Correct type]*		
2. Fulfilled contract value[3]	*[Actual contract value fulfilled based on acceptance value, contract liquidation]*		
3. Scale	*[Scale according to the contract]*		
4. Other characteristics	*[Other characteristics, if needed]*		

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

The contractor shall carefully study the Invitation to Bid and proposes similar contracts to ensure the requirements of the Invitation to Bid are complied.

[1] In case of consortium, each member must declare according to this Form.
[2] Bidders only declare the similar content with the requirements of the bidding package.
[3] In case the contract value is not in VND, it shall be converted to VND at the exchange rate specified in Section 2 of Chapter III as a basis for evaluation.

Form 07B

(Not applicable)

DECLARATION OF GOODS PRODUCTION CAPACITY

(Applicable to bidders who are manufacturers)

The number of factories and production facilities (collectively referred to as factories): ____ *[Number of factories]*

For each factory, the bidder declares the following information:

Factory Name:	*[Factory name]*
Address:	*[Factory address]*
Total investment:	*[Total investment]*
Design capacity:	*[Design capacity]*
Effective capacity:	*[Effective capacity of last year]*
Production standard:	*[Current production standard, if applicable]*
Number of employees:	*[Total number of employees working at the factory]*

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

For a consortium, each member of the consortium shall declare using this Form.

Form 08A

(Not applicable)

PROPOSED KEY PERSONEL

The Bidder shall declare its key personnel as required in Section 2 of Chapter III and shall demonstrate its capability to mobilize these people to deliver the bidding package. Key personnel may be on the contractor's payroll or mobilized by the bidder. In case the key personnel declared by the bidder in its bid proposal does not meet the requirements or the contractor cannot demonstrate mobilization capability (including cases where said personnel has been mobilized for another contract with overlapping execution timeline), Vietsovpetro shall allow the bider to make addition or replacement. The bidder is allowed to make addition or replacement once for each position for a suitable period of time not less than 03 working days. In case the bidder does not have a replacement comlying the Invitation to Bid's requiments, the contractor shall be disqualified. In all cases, if the bidder declares personnel in a dishonest manner, making replacement shall not be allowed, the bid proposal shall be disqualified and the bidder shall be considered fraudulent according to the provisions of legislation on bidding or other relevant legislation and penalized accordingly.

1.	Job position *[detailed job position in the bidding package]*
	Name *[name of key personnel]*
2.	Job position *[detailed job position in the bidding package]*
	Name *[name of key personnel]*
3.	Job position
	Name
4.	Job position
	Name
5.	Job position
	Name
—	Job position
	Name

Legal representative of bidder
(Name, position, signature and stamp)

Form 08B

(Not applicable)

PROFESSIONAL CURRICULUM VITAE OF KEY PERSONNEL

The Bidder must supply all required information below and attach certified copies of original related documents.

Position		
Personnel Information	Name	Date of Birth
	Professional Qualification	
Current Job	Employer's name	
	Employer's address	
	Telephone No:	Contact person (Deputy / HR officer)
	Fax	E-mail
	Title	Number of years of experience with the present employer

Legal representative of bidder

(Name, position, signature and stamp)

Form 08C

(Not applicable)

PROFESSIONAL EXPERIENCE

Summarize professional experience in reverse chronological order. Specify professional and management experience related to the bidding package

From	To	Company/Project/Position/Related professional and management experience

Legal representative of bidder
(Name, position, signature and stamp)

Form 09

HISTORICAL CONTRACT NON-PERFORMANCE FOR THE SUPPLY OF GOODS NOT FULFILLED DUE TO FAULT OF THE CONTRACTOR IN THE PAST[1]

Name of contractor: _____
Date: _____
Name of member of the consortium contractor (if any): _____

Contracts for the supply of goods not fulfilled due to fault of the contractor in the past in accordance with Clause 2.1 Section 2 Chapter III			
☐ No contract Supply of goods not fulfilled through bidder's fault as of January 01, 2023 in accordance with Criterion 1 in the Evaluation Standards for Competence and Experience under Clause 2.1, Section 2, Chapter III. ☐ There is a contract Supply of goods not fulfilled through bidder's fault as of January 01, 2023 in accordance with the Evaluation Standards for Competence and Experience under Clause 2.1 Section 2 of Chapter III.			
Year	**Scope of work not fulfilled**	**Contract description**	**Total contract value** (value, currency, exchange rate, equivalent value in VND)
		Contract Description: _____ Name of Investor: _____ Address: _____ Causes of non-fulfillment of the contract: _____	

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

[1] The Bidder must accurately and truthfully declare contracts for the supply of goods that were not fulfilled through fault of the Bidder in the past. In case Vietsovpetro discovers that the bidder has a contract for the supply of goods that is not fulfilled due to fault of the bidder in the past which was not declared, the bidder is deemed to have committed fraud and its bid proposal shall be disqualified. For a consortium bidder, each member of the consortium must declare using this form.

Form 10

BIDDER'S HISTORICAL FINANCIAL PERFORMANCE[1]

Bidder's name: _____

Date: _____

Name of Consortium member (if any): _____

	Financial Data for Previous 03 Years[2] [VND/USD]: 2023÷ 2025		
	Year 01 (2023)	Year 02 (2024)	Year 03 (2025)
Information from balance sheet			
Total assets			
Total liabilities			
Net worth			
Current assets			
Current liabilities			
Working capital			
Information from Income Statement			
Total turnover			
Average annual turnover from business activities[3]			
Profits before taxes			
Profits after taxes			

Attached are copies of financial statements (balance sheets, including all related notes and income statements) for the last **03 years**[4], as indicated above, complying with the following conditions:

* All such documents reflect the financial situation of the legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries or affiliates.

* Historic financial statements must be audited in accordance with the applicable laws and regulations.

* Historic financial statements must be complete, including all notes to the financial statements.

* Historic financial statements must correspond to accounting periods already completed and audited. Attached with notarized copies one of following original documents:

- Tax finalization inspection report.

- Declaration form of self tax finalization report (VAT and CIT) confirmed by the Tax department/District tax department at the time of submitting the declaration form.

- Proper documentation in which the bidder has declared the electronic tax finalization.

- Confirmation in writing from tax department/ district tax department (confirmed the cumulative payment for full year) about complying paying tax duty.

- Audited report

- Other documents

Legal representative of bidder

(Name, position, signature and stamp)

Notes:

[1] In case of Consortium Bidder then each member of Consortium Bidder must declare according to this Form.

[2, 4] The period stated here should be the same as the period indicated under Criterion 2.1 of Chapter III (Bid Evaluation Criteria).
In case Bidder has less than the number of years of establishment as required in ITB, the average annual turnover is calculated on the number of years that Bidder has been established.
[3] To determine average annual turnover from business activities, the Bidder will divide total turnover from business activities in years to number of years based on supplied information.

Form 11A

(Not applicable)

SCOPE OF WORK USING SUB-CONTRACTORS[1]

No.	Name of sub-contractor[2]	Scope of work[3]	Amount of work[4]	Value estiamated[5]	Contract or agreement document with sub-contractor[6]
1.					
2.					
3.					
4.					
...					

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

[1] Applying this form in case of using sub-contractors.

[2] Bidder specifies the sub-contractor's names. In case at the moment at participating in bid, the sub-contractors have not yet been identified, bidders do not have to provide information in this column, but it should be declared in the column "Scope of work". After that, if bidder is being successful, since the sub-contractors mobilized for implementing the work have to be approved by the Vietsovpetro.

[3] Bidder specifies name and work description for the sub-contractor.

[4] Bidder specifies the scope of work for the sub-contractor.

[5] Bidder specifies the value of work percentage which the sub-contractor undertakes compared to the bidding price.

[6] Bidder specifies the contracts number or agreement documents, the bidder should submit the original or notarized copy of these documents.

Form 11B

(Not applicable)

LIST OF SPECIALIZED SUB-CONTRACTORS[1]

Bidder must provide the proof evidence which meets requirements prescribed at Point 2.3 Chapter III, Bid Proposal Evaluation criteria.

No.	Name of specialized subcontractor[2]	Scope of work[3]	Amount of work[4]	Percentage value estimated[5]	Contract or agreement document with specialized sub-contractor[6]
1.					
2.					
3.					
4.					
...					

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

[1] Applying this form in case of using sub-contractor.

[2] Bidder specifies the specialized sub-contractor's name.

[3] Vietsovpetro specifies names and work description that are implemented by the specialized sub-contractor.

[4] Bidder specifies the scope of work assigned to the specialized sub-contractor.

[5] Bidder specifies the value of work in percentage which the specialized sub-contractor undertakes to perform, compared to the bidding price.

[6] Bidder specifies the contract numbers or agreement documents, the bidder should submit the original or notarized copy of these documents.

Form 11C

LIST OF SUBSIDIARIES AND MEMBER COMPANIES DELIVERING WORK IN THE BID PACKAGE[1]

No.	Name of subsidiary/ member company[2]	Scope of work[3]	Value (% out of bid value)[4]	Notes
1.				
2.				
...				

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

[1] In the case the contractor participating in bidding, being a parent company (for example, the Corporation), mobilizes its subsidiary or member company to deliver part of the work in the bid package, it must be specifically declared in this table. The evaluation of experience and competence of the bidder is based on the value and volume of work delivered by the parent company, subsidiary and member company in the bidding package. In case the bidder participating in bidding is not the parent company, this Form shall not apply.

[2] Specify the name of the subsidiary or member company.

[3] Specify the work delivered by the subsidiary or member company.

[4] Specify how many % the value of work delivered by the subsidiary or member company accounts for in the total bid proposal value.

Form 12

SUMMARY OF BIDDING PRICE

No.	Content	Bid price
1.	Goods manufactured, processed outside Vietnam	(M_1)
2.	Goods domestically manufactured, processed or goods manufactured, processed outside Vietnam, but already imported and being offered in Vietnam	(M_2)
3.	Related services (Not Applicable)	(I)
	Total bidding price **(Transfer to Application for Biding form)**	**(M_1) + (M_2) +(I)**

Legal representative of bidder
(Name, position, signature and stamp)

Form 12A

BIDDING PRICE SCHEDULE OF GOODS MANUFACTURED, PROCESSED OUTSIDE VIETNAM

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
Line item	**Description of goods**	**Part number/ model of goods**	**MNF**	**C/O**	**Unit**	**Required quantity**	**Unit price**	**Extended Price per line item (Col. 7x8)**	**Import tax**	**VAT**	**Total Price including all taxes**
1	……								…	…	…
2	……								…	…	…
…	……										
	Total bidding price							…			
	Import tax								…		
	VAT									…	
	Total bidding price including all taxes (Transfer to the Summary of Bidding Price Form)										**M1**

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

Col. (1), (2), (6) and (7): In accordance with List of goods stipulated in Attachment 01: Scope of Supply in Part 4 – Appendices.

The bidder offers in Col. (3), (4), (5), (8), (9), (10), (11) and (12).

***For Vietnamese Bidders**: The Bidders are requested to offer price on delivery to **Vietsovpetro warehouse, HoChiMinh City, S.R. Vietnam**, including taxes, fees, charges (if any) arisen inside Vietnam.*

*Based on the Article 12.10(a), (b), (đ) of Decrees No. 87/2010/NĐ-CP dated 13th August 2010 and Article 100.11(a), (b), (e) of Circulars No. 128/2013/TT-BTC dated 10th September 2013 of Ministry of Finance on continuous cooperation in geological exploration, oil and gas exploitation at continental shelf of Socialist Republic of Vietnam, Vietsovpetro is exempted from **import tax** in territory of Socialist Republic of Vietnam when moving in/out material, equipments and goods which have not yet been produced inside Vietnam for Oilfield **on Block 04-3. Bidders are requested to confirm using quota or not. In case of using quota of Vietsovpetro for Block 09-2/09, import tax and VAT shall be quoted separately. In case of not using quota, bidders are not required to quote import tax separately**.*

***For Foreign Bidders:** The Bidders are requested to offer price on delivery term: CFR Vietsovpetro Port, HoChiMinh City, S.R. Vietnam, Incoterm 2020. Bidders must clearly state in the offered price, as followings:*

- Bidder intends to use inland transportation to delivery the goods from any discharge port in Vietnam to Vietsovpetro port: Yes/No.

- If Bidder declares its attention to use inland transportation to deliver the goods from discharge port in Vietnam to Vietsovpetro port, Vietsovpetro will calculate and add FCWT into the offered price for comparison and evaluation.

- If Bidder declares NOT to use inland transportation to transport the goods to Vietsovpetro port, or makes no statement in this regard, Vietsovpetro will not calculate and add FCWT into the offered price for comparison and evaluation. Bidder shall acknowledge that, if any inland transportation is used during performance of Contract (if awarded to Bidder), Bidder will be subject to FCWT according to the applicable regulations of S.R. Vietnam. FCWT incurred will be deducted from payment by Vietsovpetro.

When participating in bidding, all bidders have to take responsibility of researching, calculating and offering sufficient tax, fees, charges (if any) in response to tax rates, expenses, fees at the time 28 days prior to the stipulated deadline for bid submission.

In case the bidder announces the bidding price not including taxes, fees, charges then the Bid Proposal of the bidder will be rejected.

Form 12B

BIDDING PRICE SCHEDULE OF GOODS DOMESTICALLY MANUFACTURED, PROCESSED OR GOODS MANUFACTURED, PROCESSED OUTSIDE VIETNAM, BUT ALREADY IMPORTED AND BEING OFFERED IN VIETNAM

(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Line item	**Description of goods**	**Unit**	**Required quantity**	**Manufacturer, Country of origin, Part number, model of goods**	**Unit price**	**Extended Price per line item (Col. 4x6)**	**Taxes, fees, charges (if any)**
1.	Goods 1					A1	T1
2.	Goods 2					A2	T2
…	…						
n	Goods n					An	Tn
Total bidding price of goods not including taxes, fees, charges (if any)						**A=A1+A2 + ...+An**	
Total value of taxes, fees, charges (if any)							**T=T1+T2 + ...+Tn**
Total bidding price of goods including taxes, fees, charges (if any) (Transfer to the Summary of Bidding Price Form)						**M_2=A+T**	

Legal representative of bidder

(Name, position, signature and stamp)

Notes:

Detailed T1, T2 and Tn (type, calculation).

Col. (1), (2), (3) and (4): In accordance with List of Goods as stipulated in Attachment 01: Scope of Supply in Part 4 – Appendices.

The bidder offers at Col. (5), (6), (7) and (8). The bidder offers unit price at col (6), including necessary expenses to supply goods in response to requirements of Vietsovpetro, not including tax, fees, charges (if any) offered at col (8).

Col. (8) includes all tax, fees, charges (if any). When participating in bidding, bidders have to take responsibility of researching, calculating and offering sufficient tax, fees, charges (if any) in response to tax rates, expenses, fees at the time 28 days prior to the stipulated deadline for bid submission. In case the bidder announces the bidding price not including taxes, fees, charges then the Bid Proposal of the bidder will be rejected.

Form 13

(Not applicable)

BIDDING PRICE SCHEDULE OF RELATED SERVICES

(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
No.	**Description of Services**	**Required quantity**	**Unit**	**Place where services will be performed**	**Final completion date**	**Unit price**	**Extended price per Service (Col. 3x7)**
I.	**Onshore technical service**						
	……						
II.	**Offshore technical service**						
	……						
III.	**Training (if any)**						
	……						
IV.	**Other services (if any)**						
1.							
2.							
Total bidding price of related services not including taxes, fees, charges							
Taxes, fees, charges							
Total bidding price of related services including taxes, fees, charges (if any) (Transfer to the Summary of Bidding Price Form)							**(I)**

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

Col. (1), (2), (3), (4), (5) and (6): In accordance with Table of Related Services stipulated in Part 2 – The scope of supply's requirement.

The bidder offers Col. (7) and (8).

Foreign bidders have to clearly state that whether the offered price includes Foreign Contractor Withholding Tax (FCWT). If the offered price has not included, Vietsovpetro will calculate and add FCWT into the offered price for comparison and evaluation.

Form 14A

(Not applicable)

BIDDING PRICE OF GOODS (OPTIONAL SCOPE)
FOR GOODS MANUFACTURED, PROCESSED
OUTSIDE VIETNAM

(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
Line item	**Description of goods**	**Part number / model of goods**	**MNF**	**C/ O**	**Unit**	**Required quantity**	**Unit price**	**Extended Price per line item (Col. 7x8)**	**Import tax**	**VAT**	**Total Price including all taxes**
	Priced list of recommended spares for 02 years' operation. *(i.e.: as stated in Technical Requirement)* *Detailed list of spare parts and prices shall be provided:*										
1.	……								…	…	…
2.	……								…	…	…
…	……										
	Total bidding price							…			
	Import tax								…		
	VAT									…	
	Total bidding price including all taxes (Transfer to the Summary of Bidding Price Form)										**M1**

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

Refer to Notes in Form 12A.

Form 14B

(Not applicable)

BIDDING PRICE OF GOODS (OPTIONAL SCOPE)

FOR GOODS DOMESTICALLY MANUFACTURED, PROCESSED OR GOODS MANUFACTURED, PROCESSED OUTSIDE VIETNAM, BUT ALREADY IMPORTED AND BEING OFFERED IN VIETNAM

(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Line item	**Description of goods**	**Unit**	**Required quantity**	**Country of Origin, Part number, model of goods**	**Unit price**	**Extended Price per line item (Col. 4x6)**	**Taxes, fees, charges (if any)**
1.	Goods 1					A1	T1
2.	Goods 2					A2	T2
…	…						
n	Goods n					An	Tn
Total bidding price of goods not including taxes, fees, charges (if any)						**A=A1+A2+ ...+An**	
Total value of taxes, fees, charges (if any)							**T=T1+T2+ ...+Tn**
Total bidding price of goods including taxes, fees, charges (if any) (Transfer to the Summary of Bidding Price Form)						**M_2=A+T**	

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

Refer to Notes in Form 12B.

Form 15A

DECLARATION OF PREFERENTIAL GOODS[1]

No.	Item	Origin *[name of country, origin, marks and numbers, model/PN, manufacturer]*	Goods with domestic production cost of 25% or higher		Domestic cost declaration	
			Yes	No	Form 15B	Form 15C
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
1.	Goods 1		□	□	□	□
2.	Goods 2		□	□	□	□
…	…					
n	Goods n		□	□	□	□

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

(1) and (2): The bidder fills consistently with Form 15B or Form 15C.

(3) and (4): The bidder checks the correct box for each goods.

(5) and (6): For goods with a domestic production cost of 25% or higher, the contractor either declares the cost of domestic production using Form 15B (Declaration of cost of import) or Form 15C (Declaration of production cost in Vietnam).

Form 15B

DECLARATION OF DOMESTIC PRODUCTION COSTS FOR PREFERENTIAL GOODS

(In the case of declaring cost of import)

No.	Item	Offered price in Bid proposal	Taxes	Cost of import	Cost of domestic production	Cost of domestic production (%)
		(I)	**(II)**	**(III)**	**G* = (I) – (II) – (III)**	**D(%)=G*/G where đó G = (I) – (II)**
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
1.	Goods 1					
2.	Goods 2					
…	…					
n	Goods n					

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

(1) The bidder fills in the checked goods in column (3) and (5) of Form 15A.

(2) The bidder fills in the unit price offered (including all taxes, fees, charges (if any)).

(3) and (4) The bidder self-declares.

(5) and (6) The bidder fills.

Form 15C

DECLARATION OF DOMESTIC PRODUCTION COST FOR PREFERENTIAL[(1)]

(In the case of declaring production costs in Vietnam)

No.	Item	Offered price in Bid proposal	Taxes[(2)]	Cost of domestic production	Cost of domestic production (%)
		(I)	(II)	G*	D(%)=G*/G where G = (I) – (II)
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
1.	Goods 1				
2.	Goods 2				
…	…				
n	Goods n				

Legal representative of bidder
(Name, position, signature and stamp)

Notes:

(1) The bidder fills in the checked goods in column (3) and (6) of Form 15A.

(2) The bidder fills in the unit price offered (including all taxes, fees, charges (if any)).

(3) and (4) The bidder self-declares.

(5) The bidder fills.

FORM 16. Mẫu cung cấp thông tin và cam kết của nhà thầu

CÔNG TY ……. **CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM**
Độc lập – Tự do – Hạnh phúc

ĐƠN XÁC NHẬN PHƯƠNG THỨC KÝ ĐIỆN TỬ/CHỮ KÝ SỐ
(Dành cho Nhà thầu đáp ứng đủ điều kiện)

Kính gửi: **Liên doanh Việt – Nga Vietsovpetro**

Bằng công văn này, [Tên công ty] ("Nhà thầu") cung cấp các thông tin sau đây để phục vụ cho việc ký kết các thỏa thuận, hợp đồng và các văn bản khác được thiết lập dưới dạng thông điệp dữ liệu ("Hợp đồng điện tử" hay "Hợp đồng") phù hợp với quy định của pháp luật, đảm bảo hiệu lực pháp lý đầy đủ cho các Hợp đồng điện tử với Liên doanh Việt – Nga Vietsovpetro.

I. THÔNG TIN NHÀ THẦU/ĐỐI TÁC

1. Tên đơn vị: .....
2. Mã số thuế: .....
3. Giấy Chứng nhận đăng ký kinh doanh: .....
4. Địa chỉ trụ sở chính: .....
5. Điện thoại: ..... Fax: .....
6. Email giao dịch chính thức: .....

II. THÔNG TIN NGƯỜI ĐẠI DIỆN THEO PHÁP LUẬT

1. Họ và tên: .....
2. Chức danh: .....
3. Giấy tờ pháp lý (CMND/CCCD/Hộ chiếu):
   - Số: ..... Ngày cấp: ...../...../.....
   - Nơi cấp: .....
4. Email: ..... Số điện thoại: .....

III. THÔNG TIN NGƯỜI TRỰC TIẾP THỰC HIỆN KÝ ĐIỆN TỬ/CHỮ KÝ SỐ

(Chỉ khai nếu khác với người đại diện theo pháp luật)

1. Họ và tên: .....
2. Chức danh: .....
3. Bộ phận/phòng ban: .....
4. Email công việc dùng để nhận thông báo/hợp đồng: .....
5. Số điện thoại: .....
6. Căn cứ ủy quyền:
   - Số, ngày văn bản ủy quyền: .....

Kèm theo văn bản ủy quyền có hiệu lực và phạm vi ủy quyền rõ ràng.

IV. PHƯƠNG THỨC KÝ ĐIỆN TỬ/CHỮ KÝ SỐ ĐƯỢC SỬ DỤNG

1. Đối với chữ ký số (nếu có):

- Loại chữ ký số:
  ☐ Chữ ký số công cộng (USB Token)
  ☐ Chữ ký số từ xa (VNPT SmartCA, Viettel-CA, …)
- Tổ chức cung cấp dịch vụ chứng thực chữ ký số (CA): .....
- Số sê-ri chứng thư số: .....
- Ngày cấp: ...../...../..... Ngày hết hạn: ...../...../.....

V. CAM KẾT CỦA NHÀ THẦU/ĐỐI TÁC

Chúng tôi, nhà thầu **[Tên Công ty]**, xin cam kết:

1. **Về tính chính xác thông tin**
   - Tất cả thông tin nêu trên là đúng, đầy đủ và hợp pháp tại thời điểm ký Đơn này;
   - Mọi thay đổi sẽ được Nhà thầu thông báo bằng văn bản cho Vietsovpetro trong thời gian …… ngày làm việc kể từ ngày phát sinh thay đổi, và trước thời điểm ký kết Hợp đồng kế tiếp.
   - Trường hợp Nhà thầu không thông báo kịp thời, mọi Hợp đồng điện tử được ký trên cơ sở thông tin mà Nhà thầu đã cung cấp trước đó vẫn có giá trị pháp lý và ràng buộc Nhà thầu.
2. **Về việc sử dụng và quản lý phương thức ký điện tử/chữ ký số**
   - Nhà thầu tự tổ chức việc quản lý, bảo mật tài khoản, thiết bị, khóa bí mật, mã OTP, email và các phương tiện xác thực khác dùng để ký Hợp đồng điện tử;
   - Mọi giao dịch, Hợp đồng điện tử được thực hiện thông qua tài khoản/phương thức ký nêu trên được coi là do Nhà thầu thực hiện, trừ trường hợp trước thời điểm ký kết Hợp đồng Nhà thầu đã thông báo bằng văn bản cho Vietsovpetro về việc tài khoản/phương tiện ký bị mất, lộ, chiếm đoạt và yêu cầu ngừng sử dụng.
3. **Về giá trị pháp lý của việc ký điện tử/chữ ký số**
   - Nhà thầu chấp thuận rằng:
     - Chữ ký số hợp lệ (còn hiệu lực chứng thư số, không bị thu hồi/tạm dừng theo quy định pháp luật) của người đại diện theo pháp luật hoặc người được ủy quyền của Nhà thầu trên Hợp đồng điện tử với Vietsovpetro có giá trị pháp lý như chữ ký tay của người đại diện có thẩm quyền trên hợp đồng giấy;
   - Nhà thầu không phủ nhận giá trị pháp lý của Hợp đồng điện tử chỉ vì:
     - Hợp đồng được thể hiện, ký, gửi hoặc lưu trữ dưới dạng thông điệp dữ liệu;
     - Việc ký được thực hiện trên bất kỳ nền tảng, phần mềm, hệ thống ký số nào, trong đó có hệ thống eOffice của Vietsovpetro;
     - Nhà thầu thay đổi người đại diện theo pháp luật, người đại diện theo ủy quyền, con dấu, hoặc tài khoản/phương tiện ký bị mất, lộ, chiếm đoạt nhưng không thông báo kịp thời.

4. **Về tuân thủ pháp luật**
   - Nhà thầu cam kết tuân thủ và duy trì tuân thủ các điều kiện pháp luật về sử dụng chữ ký điện tử/chữ ký số, dịch vụ chứng thực, giao dịch điện tử trong suốt thời gian giao kết và thực hiện Hợp đồng với Vietsovpetro.

Đơn này được lập dưới dạng **thông điệp dữ liệu/văn bản giấy**, có giá trị kể từ ngày ký và được áp dụng cho tất cả các Hợp đồng điện tử giữa [Tên Nhà thầu] và Vietsovpetro, cho đến khi có văn bản thay thế hoặc hủy bỏ.

…, ngày … tháng … năm …

ĐẠI DIỆN THEO PHÁP LUẬT CỦA NHÀ THẦU

Part 2. TECHNICAL REQUIREMENTS

Chapter V. Technical Requirements

(Refers to attachment in Part 4 – Appendices)

Part 3. CONDITIONS OF CONTRACT AND CONTRACT FORMS

Form 16. Letter of Proposal Acceptance and Contract Award

Form 17. Contract form

Form 17

LETTER OF PROPOSAL ACCEPTANCE AND CONTRACT AWARD

_____, day ____ month ___ year ____

To: _____ *[name and address of awarded Contractor, hereinafter referred to as "Contractor"]*

Subj: Notification of Proposal Acceptance and Contract Award

Dear Sir/Madam,

In accordance with the Letter of Invitation to Tender (ITB No. ……) regarding tender process, we would like to notify that you are the tender winner for the items listed hereunder (scope of supply) based on the following basic terms and conditions:

- Scope of Supply: ……
- Total price: …… – CFR Vietsovpetro port, Vungtau City, S.R. Vietnam
- Delivery time: …… days from the date of Letter of Award / contract signing
- Payment condition: TT / LC

As soon as possible but not later than 07 working days from the date signing this Purchase Order, you should open the Performance Bond which is issued by banks / branches legally operated in Vietnam with amount 08% (eight percent) of Purchase Order and send to Vietsovpetro. The validity of the Guarantee is equal to the delivery time plus 60 calendar days.

Please acknowledge the receipt of this letter and send us your acceptance / comments as soon as possible but not later than 02 working days from the date of this letter.

Looking forwards to receiving your favorable reply.

LEGAL REPRESENTATIVE OF THE EMPLOYER

[Full name, title, signature and stamp]

Form 18

CONTRACT FORM

GENERAL CONDITIONS OF CONTRACT (GCC)

1. Definitions

As used in this Contract:

1.1 Company means Vietsovpetro, as specified in the Purchase Order;

1.2 "Purchase Order" means the documented Agreement between the Company and the Contractor, including all attached appendices and documents; herein called PO;

1.3 "Contractor" means the bidder who has been awarded PO by the Company (either Independent or Consortium Contractor) and is specified in the PO;

1.4 "Subcontractor" means a person, or entity, Contractor whose name is proposed in the list of subcontractors by the Contractor in the Proposal or who carries out any part of work proposed by the Contractor in the Bid Proposal. Subcontractor enters into the PO with the Contractor to perform part of work, as specified in the Proposal and accepted by the Company;

1.5 "PO Documents" means the documents listed in the PO, including any amendments, addendums thereto;

1.6 "PO Price" means the total price as specified in the PO for supplying Goods (and Related Services). PO Price include all taxes, fees and charges (if any);

1.7 "Date" means calendar day; "Year" means 365 days;

1.8 "Goods" means all of the machinery, equipment, commodities, spare parts, raw materials, consumer goods, medical material used at medical facilities;

1.9 "Related Services" means the services such as warranty, maintenance, overhaul, repair, supply of spare parts and/or other after-sale services including training, technology transfer;

1.10 "Completion" means the fulfillment of the Related Services by the Contractor in accordance with the terms and conditions set forth in the Contract;

1.11 "The Project Site" means the place named in the PO.

2. Order of precedence

The documents forming the Contract is arranged in the following order of precedence:

2.1 PO, including all Appendix;

2.2 Letter of Proposal Acceptance and Contract Award;

2.3 Bidding Result Approval;

2.4 General Conditions of Contract (GCC);

2.5 Proposal and Clarifications (if any);

2.6 Invitation for Bid and Bulletins (if any);

2.7 Any other document listed in the PO.

3. Governing law and Language

The Contract shall be governed by and interpreted in accordance with the laws of the Socialist Republic of Vietnam. The Contract shall be written in English.

4. Notice

4.1 Any notice from one Party to another relating to the PO shall be conducted in writing, to addresses specified in the PO. The term "in writing" means communicated in written form with proof of receipt.

4.2 A notice from one Party shall be considered as effective from the date the other Party receives it or from the effective date as specified in the notice, whichever comes later.

5. Performance Bond

5.1 Performance Bond shall be submitted to the Company no later than the date specified in Letter of Proposal Acceptance and Contract Award. Performance Bond shall be issued in one of following forms:

a) Submit a performance bond issued by a legally domestic bank or foreign bank's branch established under Vietnamese law;

b) Submit the certificate of guarantee insurance from a domestic non-life insurance enterprise or a branch of a foreign non-life insurance enterprise established under Vietnamese law.

The Performance Bond specified in Point a and b of this Clause is an unconditional guarantee (paid upon request), according to the form specified in the PO or another form approved by the Company.

5.2 Validity and formality is specified in the PO.

5.3. The Performance Bond will be paid to the Company to compensate for any loss arising from the Contractor's failure to fulfill their contractual obligations.

5.4 The return of Performance Bond is specified in the PO.

6. Subcontractor

6.1 The Contractor is allowed to sign contracts with Subcontractors in the List of proposed subcontractors specified in the Contract to perform part of work stated in the Proposal. The use of subcontractors shall not relieve the Contractor from any of his obligations. The Contractor shall take full responsibilities for work load, quality, progress and other responsibilities for work performed by Subcontractors.

The changing, supplement of subcontractors onto List of subcontractors or the change of subcontractor content stated in the Proposal shall be only conducted with reasonable grounds and Company's approval.

6.2 Contractor is not allowed to use subcontractors for other work which are not stated in the Bid Proposal.

6.3 Other requirements for subcontractor are specified in the PO.

7. Settlement of Disputes

7.1 The Company and the Contractor shall make every effort to resolve amicably by negotiation any disagreement or dispute arising between them.

7.2 If the dispute has not been resolved by such mutual negotiation within the specified duration in the PO from the date on which dispute arose, then either party may ask to commence arbitration under the dispute resolution mechanism, as specified in the PO.

8. Scope of Supply

Goods (and Related Services) shall be supplied as specified in Appendix No. 01 – Scope of Supply, which is considered as an integral part of this PO, including types of goods (and Related Services) supplied by the Contractor and their unit prices.

9. Delivery Schedule of Goods, Completion Date of Related Services (if any) and Documentations

Delivery Schedule of Goods, Completion Date of Related Services (if any) must be performed according to the provisions of the PO. The Contractor must provide invoice and other documents as described in the PO.

10. Contractor's Responsibilities

Contractor shall supply all Goods (and Related Services) (if any) in accordance with the Scope of Supply in accordance with GCC Clause 8, and follow the Delivery Schedule of Goods (and Completion Date of Related Services), as per GCC Clause 9.

11. Type of Contract and Contract Price

Type of contract: is specified in the PO.

Contract Price specified in the PO covers all expenses for complete supplying Goods (and Related Services) stated in the Price schedule of the PO.

12. Tax Adjustment

12.1 The Contractor shall be responsible for all costs of taxes, fees and charges incurred until the goods are delivered to the Company.

12.2 In case the Contractor is eligible for tax, fee and charge exemption or reduction, the Company shall use its best efforts to enable the Contractor to apply tax, fee and charge exemption or reduction policies.

12.3 Tax adjustment are carried out in accordance with the PO.

13. Advance Payment

13.1 The Company shall make advance payment to the Contractor with an amount stated in the Contract upon provision of Advance Payment Guarantee by the Contractor, with the value equal to the advance payment. The Advance Payment Guarantee shall be issued by a bank or credit organizations legally operating in Vietnam and shall remain effective until the advance payment has been repaid; the value of the Advance Payment Guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be applied on the advance payment.

13.2 The Contractor is to use the advance payment only for the purpose of executing the Contract. The Contractor has to prove that advance payment has been used for the right purpose by providing copies of invoices or other relevant documents to the Company. The Contractor shall be deprived of advance payment if advance payment is not used correctly.

14. Payment

14.1 Payments are made in accordance with the PO.

14.2 The payment currency shall be VND/USD/EUR in accordance with the PO.

15. Copyright

Copyright in all drawings, documents and records containing information and data submitted by the Contractor to the Company remains vested in the Contractor. Where such drawings, documents and records are provided to the Company directly or through the Contractor by a third party, copyright in such drawings, documents and records shall remain vested in that third party.

16. Use of documentations and information relating to Contract

16.1. The Company and the Contractor shall keep confidential any documents, data or other information relating to the contract provided directly or indirectly by one party to the other party, and shall not disclose such documents, data or information to a third party without the prior written consent of the other party, whether such documents, data or information are provided before, during or after the fulfillment or termination of the contract. The Contractor may transfer to a subcontractor appropriate documents, data and information provided by the Company for the subcontractor to perform its work under the contract; in this case, the subcontractor shall have an undertaking to the Contractor to keep such documents, data or information confidential.

16.2. The Company shall not use the documents, data and other information received from the Contractor for any purpose other than the contract. The Contractor shall not use the documents, data and other information received from the Company for any purpose other than the performance of the contract.

16.3. The obligations of the Company and the Contractor specified in under GCC Sub-Clauses 16.1 and 16.2 shall not apply to information that:

a) Information that the Company or Contractor needs to provide to the competent authority;

b) Information that has been or will be published through no fault of the Company or Contractor;

c) Information owned by one party at the time of publication and not previously provided directly or indirectly by the other party;

d) Information that a party lawfully receives from a third party that is not under an obligation to keep the information confidential.

16.4. The provisions of GCC Clause 16 shall not in any way modify any confidentiality commitments made by a party prior to the date of signing the contract relating to the provision of goods and services.

16.5. The provisions of GCC Clause 16 shall continue in effect after fulfillment or termination of the contract for any reason.

17. Technical Specifications and Standards

Goods (and Related Services) supplied under this Contract shall conform to the technical specifications and standards mentioned in Appendix No. 01 - Scope of Supply; and when no applicable specification or standard is mentioned, the applicable specification or standard shall be equivalent or superior to the official standards currently applied in the Goods' country of origin.

18. Packing

The Contractor shall provide such packing of the Goods as is required in the PO and is suitable with each type of transportation means during transit to their final destination. The packing shall be sufficient to prevent the Goods from damage or deterioration due to rough handling and other environmental impacts. Packing case size and weights shall take into consideration the conditions of transportation such as distance, type of transport mean, infrastructure, etc. from origin to specified destination.

19. Insurance

Goods supplied in the Contract shall be fully insured to cover losses or damages occurred in production process, transportation, stocking and delivery as described in the PO.

20. Transportation and Incidental Services

Conditions about Transportation and Incidental Services are specified in the PO.

21. Goods Inspections and Testing

The Contractor must test and take inspection of Goods and related services relevant to the provisions of the Contract and bear all testing and inspection costs according to the provisions of the Contract.

22. Damages

Damages are specified in the PO.

23. Warranty

The Contractor warrants that all the Goods supplied under Contract are new, unused, and the quality is in accordance with manufacture standard, unless otherwise provided in the Contract. The Contractor further warrants that the Goods shall be free from defects that cause problems under normal use.

Warranty period and place for the Goods is specified in Article 9 of the PO.

24. Force Majeure

24.1 For purposes of this Clause, "Force Majeure" means events beyond the control and foreseeability of the parties, such as wars, revolutions, fires, natural disaster, floods, epidemics, quarantine restrictions.

If a Force Majeure situation arises, the affected party shall promptly notify the other party in writing of such condition and the cause thereof. The affected party also has to give given by authorised organisation in the place of event.

During the Force Majeure, Contractor shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event. In this case, the Company shall consider reimbursing the Contractor necessary and reasonable additional and necessary costs beared by the Contractor.

24.2 Neither the party shall be liable for forfeiture of its Performance, liquidated damages, or if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

In case dispute arising due to Force Majeure shall be resolved according to GCC Clause 7.

25. Amendment, Addendum of Contract

25.1 Amendments to the Contract shall be applied in the following cases:

(a) Changes in drawings, designs, or technical requirements, where Goods to be furnished under the Contract are to be specifically manufactured for the Company;

(b) Changes in method of goods transportation or packing;

(c) The place of delivery;

(d) Changes of related services;

(e) The schedule of delivery.

25.2. In case the amendment, addendum to the work content of the contract specified in Clause 25.1 GCC change the cost or implement time of any terms in the contract, price or delivery time and the completion date of the relevant service must be make corresponding adjustments and the two parties will amend the contract. The Contractor's request to adjust the contract's price, delivery time or completion date must be made within 28 days from the date the Contractor receives the Company's request to amend the scope of work.

25.3. In case the Contractor provides goods with a new version of the same manufacturer, the same origin, with technical requirements, configuration, parameters... equivalent or better than the version that the Contractor proposed in their proposals, the Contractor must notify the Company in writing for the Company's consideration. In this case, based on usage needs, the Company could accept the Contractor's proposal provided that the unit price and other terms and conditions of the contract remain unchanged.

25.4. In case of performing related services that has not stated in the contract, the Company and Contractor will negotiate to ensure the unit price is consistent with the market price.

25.5. The Company and the Contractor will negotiate to sign a contract's amendment in case of amendments. All transactions during the implementation of the Contract are made in writing by the Parties and sent by post or by fax number to the registered address or fax number of each Party specified in the Contract and email to the email address according to the form in Appendix 04 (A, B) attached.

In case the Contractor's proposal is accepted by the Company and it makes the reduce of the contract price, the Company shall pay the Contractor with the rate that specified in the Contract to the price reduction value. And if it makes the increase of the contract price, the Company shall pay the Contractor the arising value.

26. Amendment in Delivery Schedule

26.1. During the contract implementation time, in case of unfavorable conditions arise that prevents the Contractor or subcontractor from providing goods and performing related services as prescribed in Clause 9 GCC, The Contractor must promptly notify the Company in writing about the delay, reason, and duration of delay. Based on the Contractor's notice, the Company must quickly consider the situation and extend the contract. In case the Company agrees to extend the contract, the two parties will negotiate to sign amendments, supplement the contract.

26.2. Except the force majeure specified in Clause 24 GCC, if the Contractor delivers the Goods or completes related services lately, he is obliged to compensate the Company as prescribed in Clause 22 GCC.

27. Contract Termination

27.1. Contract Termination due to faults:

a) The Company may terminate partial or all of the Contract without prejudice to other remedies for breach of contract by informing the Contractor by letter about the breachs in the contract in the following cases:

(i) The Contractor cannot deliver the goods or part of the goods within the shipment time as specified in the contract, or within the extension period as specified in Clause 26 GCC;

(ii) The Contractor does not perform any other obligations under the contract;

(iii) The Company show that the Contractor violated one of the prohibited acts specified in Article 16 of the Bidding Law during the bidding process or contract implementation;

b) In case the Company terminates partial or all of the contract according to Point a of this Clause, the Company may purchase similar goods and related services that have not been performed according to the terms and conditions and methods. The Contractor shall be responsible for compensating the Company for arising costs from purchasing of such similar goods and services. However, the Contractor must continue to perform the part of the contract that was not terminated.

27.2. Contract Termination due to insolvency

In case the Contractor goes bankruptcy or becomes insolvency, the Company may terminate the contract at any time by sending notice to the Contractor. In such case, the Contract shall terminate and the Contractor shall not be entitled to compensation provided that termination shall not fact or prejudice any rights of action or remedy of the Company at any time.

28. Patent indemnity

28.1. The Contractor shall, subject to the Company's compliance with GCC Sub-Clause 28.2, indemnify and hold harmless the Company and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Company may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the contract by reason of:

a) The installation of goods by the Contractor or the use of goods in Vietnam;

b) The sale of the products produced by goods.

Such indemnity shall not cover any use of goods or any part thereof other than for the purpose indicated by or to be reasonably inferred from the contract, neither any infringement resulting from the use of goods or any part thereof, or any products produced thereby in association or combination with any other equipment, plant, or materials not supplied by the bidder, pursuant to the contract.

28.2. If any proceedings are brought or any claim is made against the Company arising out of the matters referred to in GCC Sub-Clause 28.1, the Company shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Company's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

28.3. If the Contractor fails to notify the Company within 28 days after receipt of such notice, that it intends to conduct any such proceedings or claim, then the Company shall be free to conduct the same on its own behalf.

28.4. The Company shall, at the Contractor's request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.

28.5. The Company shall indemnify and hold harmless the Contractor and its employees, officers, and subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Contractor may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the contract arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Company.

29. Change in laws and regulations

Unless otherwise specified in the contract, if after the date of 28 days prior to deadline for submission of bids, any law or regulation is promulgated, abrogated, or changed Vietnam that subsequently affects the Delivery Date and/or the contract Price, then such Delivery Date and/or Contract Price shall be correspondingly increased or decreased, to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the contract. Notwithstanding the foregoing, such additional or reduced cost shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with GCC Clause 11.

30. Export restriction

Any to provide deliveries or services, provided that the Contractor can declare to the satisfaction of the Company that it has completed all formalities in a timely manner, including applying for permits export restrictions which arise from trade regulations from a country supplying the goods or services, and which substantially impede the Contractor from meeting its obligations under the contract, shall release the Contractor from the obligation, authorizations, and licenses necessary for the export of the goods or services under the terms of the contract. Termination of the contract on this basis shall be for the Company's convenience.

PURCHASE ORDER

_____, day ___ month ___ year ____

FACSIMILE

PURCHASE ORDER No. ……

This Facsimile Transmission (Total ____ pages)	
Company:	**……**
Country:	**……**
Fax:	**……**
From:	**Vietsovpetro – PC Block 04-3**
	105 Le Loi Str., Vung Tau Ward, HoChiMinh City, S.R. Vietnam
Subj.:	**Provision of …… (VSP's Inquiry No. ……)**

Dear Sir,

Thank you for your offer **Provision of …… (VSP's Inquiry No. ……)**. We are pleased to confirm this Purchase Order on the terms and conditions as follows:

This transaction is made between:

VIETSOVPETRO – PC BLOCK 04-3

105 Le Loi Street, Vung Tau Ward, HoChiMinh City, S.R. Vietnam

Hereinafter referred to as the Buyer.

AND

……

Hereinafter referred to as the Seller.

ARTICLE 1: OBJECT

The Seller agrees to sell and the Buyer agrees to buy **…… (VSP's Inquiry No. …….)** hereinafter referred to as "Goods", with the quantity, specifications, scope of supply as described in Appendix No. 01 (in … pages) which are considered as an integral part of this Purchase Order.

- All Goods are manufactured in ……
- The Goods will be used for Petroleum activities in Block … of Vietsovpetro.

ARTICLE 2: PRICE AND TOTAL VALUE

2.1 The unit prices for the Goods are specified in the Appendix No. 01 of this Purchase Order.

2.2 The total value of this Purchase Order is **USD ……. –** CFR Vietsovpetro Port, HCM City City, S.R Vietnam – Incoterms 2020.

(In words: ……)

2.3 The price as mentioned above is understood CFR – Vietsovpetro Port, HCM City, S.R. Vietnam – Incoterms 2020, not subject to any alteration and includes value of the Goods, packing, marking, painting, assembling, testing, inspection, manufacturer's certificates,

freight, export license if necessary, guarantee services if any etc… in accordance with terms and conditions of this Purchase Order as well as all duties levied in connection with the performance of this Purchase Order outside the Buyer's country.

ARTICLE 3: DELIVERY

3.1 Delivery date: **Group 1: not later than 120 calendar days and Group 2: not later than 84 calendar days** from the date of issuing Letter of Award (LOA) to the date that the Goods arrival at Vietsovpetro's port (included navigation and transportation time).
Earlier shipment is allowed.
Partial shipment is allowed: max **……** shipments.
Transshipment and multimodal transport are allowed at Seller's care and account.

3.2 Shipment to be made from … port to Vietsovpetro Port, HoChiMinh City, S.R. Vietnam on the term CFR Vietsovpetro Port, HoChiMinh City, S.R. Vietnam – Incoterms 2020, except the otherwise stated in this Purchase Order.

Earlier shipment is allowed.
Partial shipment is allowed.
Transshipment and multimodal transport are allowed at Seller's care and account.

The Seller shall be responsible for any extra transport, warehouse expenses, taxes and other charges incurred in connection with sending of Goods to the other port/wrong port (rather than Vietsovpetro port, HoChiMinh City, S.R. Vietnam). The Buyer shall carry out all inland transportation from other port to Vietsovpetro port, HoChiMinh City, S.R. Vietnam and these charges will be deducted from payment by the Buyer.

If Seller does not clarify inland transportation in offered price:

In case Seller discharge goods at any discharge port in S.R. Vietnam and then use inland transportation to deliver goods from any discharge port in S.R. Vietnam to Vietsovpetro port, HoChiMinh City, S.R. Vietnam, the Seller will be subject to Foreign contractor withholding tax (FCWT) according to the current regulations of S.R. Vietnam. FCWT incurred will be deducted from payment by the Buyer.

For the mode of transport by sea or by air, in case the first import border gate (which is the port of discharge stated on the bill of lading or the customs declaration) is not Vietsovpetro port, Vungtau City, S.R. Vietnam (the port specified in the Purchase Order) and incur inland transportation to the port specified, the Seller will be subject to Foreign contractor withholding tax (FCWT) according to the current regulations of S.R. Vietnam. Any extra transport, warehouse expenses, other charges and FCWT incurred will be deducted from payment by the Buyer.

3.3 The Delivery Date is understood as: The date that Goods arrival at Vietsovpetro port (included navigation and transportation time).

The date of arrival mention here will following the date of arrival of the Goods at Vietsovpetro port that indicated in "Arrival Notice" of Vessel Agent.

3.4 The carrying vessel must have ISM certificate.

ARTICLE 4: NOTICE OF SHIPMENT AND DOCUMENTATION

4.1 The Seller shall notify the Buyer by fax as soon as possible, but not later than 03 working days from the Bill of Lading date the following information regarding the shipment:

- Purchase Order Number.
- Name of Goods, quantity and value.
- Number of cases, gross weight, measurement.
- Bill of Lading number and its date.
- Name of vessel, nationality.

- Port of exit, ETD/ ETA.
- Address, telephone, fax of the shipping agent in Vietnam.
- Any other special instructions, which should call to the Buyer's attention.

The Seller shall be responsible for any losses, expenses which may be occurred due to incorrect information from the Seller to the Buyer.

4.2 Required shipping document for purchased goods.

4.2.1 By T/T:

Immediately but not later than 03 working days from the Bill of lading date the Seller shall send by Express courier or FEDEX or DHL at the Seller's expenses to "Vietsovpetro" – 105 Le Loi Str., HoChiMinh City, S.R. Vietnam the following shipment documents:

1. ***Clean on board Bill of Lading*** evidencing shipment from … port with destination Vietsovpetro Port, Vungtau City, S.R.Vietnam, consignee: Vietsovpetro 105 Le Loi Street, Vungtau City, S.R. Vietnam, marked "Freight prepaid": 02 Surrenders and 02 copies.

2. ***Detailed Packing List*** showing the content of each case or lot, gross and net weight: covering Goods as specified in Appendix No. 01 to this Purchase Order: 02 originals and 02 copies.

3. ***Signed Commercial Invoice*** issued by the Seller for the respective shipment value indicating CFR Vietsovpetro Port, HCM City, S.R.Vietnam, with itemized and total prices: 02 originals and 02 copies.

4. ***Certificate of Origin*** issued by the Commerce Department of Manufacturer's country or Exporter's country: 02 originals / electronic provided web-link to check and 02 copies.

5. ***Certificate of Quality and Quantity*** issued by manufacturer: 02 originals and 02 copies.

6. ***Other Certificates*** as stipulated in Technical Requirements: 02 originals and 02 copies.

7. ***Certificates of Guarantee*** issued by the Seller for the quality of Goods for the period of 18 months from the date of signing the Acceptance Protocol or 12 months from the date that the goods is put in in-service use, whichever is earlier: 02 originals and 02 copies.

8. ***Export License*** or ***Letter of the Seller*** stating that Export License is not necessary for export: 02 originals and 02 copies.

9. ***Seller's fax*** advising the shipment details (Invoice value, Bill of Lading date) to Vietsovpetro: 01 copy.

All the copies of the documents shall be legible, otherwise the photocopy of the original shall be furnished.

Seller shall be submit for Vendor data register list (VDRL) to Buyer for review/approval not later than 02 weeks from the date of Letter of Intent.

4.2.2 By L/C:

Immediately but not later than 05 working days from the Bill of lading date the Seller shall send by Express courier or FEDEX at the Seller's expenses to Vietsovpetro - 105 Le Loi Str., HoChiMinh City, S.R. Vietnam the following shipment documents unless otherwise stated:

1. ***Clean on board Bill of Lading*** evidencing shipment from …. port with destination Vietsovpetro Port, Vungtau City, S.R.Vietnam, consignee: Vietsovpetro 105 Le Loi Street, HCM City, S.R. Vietnam, marked "Freight prepaid": 02 Surrenders and 02 copies.

2. ***Detailed Packing List*** showing the content of each case or lot, gross and net weight: covering Goods as specified in Appendix No. 01 to this Purchase Order: 02 originals and 02 copies.

3. ***Signed Commercial Invoice*** issued by the Seller for the respective shipment value indicating CFR Vietsovpetro Port, HCM City, S.R.Vietnam, with itemized and total prices: 02 originals and 02 copies.

4. ***Certificate of Origin*** issued by the Commerce Department of Manufacturer's country or Exporter's country: 02 originals / electronic provided web-link to check and 02 copies.

5. ***Certificate of Quality and Quantity*** issued by manufacturer: 02 originals and 02 copies.

6. ***Other Certificates*** as stipulated in Technical Requirements: 02 originals and 02 copies.

7. ***Certificates of Guarantee*** issued by the Seller for the quality of Goods for the period of 18 months from the date of signing the Acceptance Protocol or 12 months from the date that the goods is put in in-service use, whichever is earlier: 02 originals and 02 copies.

8. ***Export License*** or ***Letter of the Seller*** stating that Export License is not necessary for export: 02 originals and 02 copies.

9. ***Seller's fax*** advising the shipment details (Invoice value, Bill of Lading date) to Vietsovpetro: 01 copy.

All the copies of the documents shall be legible; otherwise the photocopy of the original shall be furnished.

4.3 If shipment to be made through a FIATA Freight Forwarder, under Through or Combined Transport Bill of Lading, the Seller shall have to send the Buyer by fax the copy of Local Bill of Lading of the last distance and inform the Buyer the name, address of the Transportation Agent in Vietnam.

4.4 Any storage demurrage or other charges due to non-receipt of shipping advice and/or shipping documents by the Buyer from the Seller or the Seller's agent as well as due to incorrect shipping document shall be at the Seller's account.

4.5 From the date of Letter of Award (LOA), The Seller must provide the Buyer with a regular report once a month on the first day of the month, showing the process of manufacturing, manufacturing, testing and supplying the Goods.

This report please send to email: .....@vietsov.com.vn and c/c: …hq@vietsov.com.vn. The Seller must immediately report to Buyer the content of the report at least includes the following contents:

a) Description of the work completed in the implementation stage;

b) Highlighting delays or delays that are likely to occur and the causes of delays affecting production progress and providing measures to ensure progress;

c) Change progress if any. During the implementation of the Purchase Order, all contacts of Seller send an official letter for VSP leader and send a copy by email: .....@vietsov.com.vn and c/c: …hq@vietsov.com.vn.

4.6 Party B must ensure to provide all necessary documents as required in Article 4.2 of this Purchase Order when delivering goods to Party A. In case Party B delivers goods to Party A's warehouse in HoChiMinh City but does not have all the required documents, Party A agrees to allow Party B to temporarily store the goods at the warehouse to wait for the complete collection of documents at no extra charge for first 05 calendar days. From the 6th day onwards, Party B will have to pay Party A the storage cost of the shipment according to the current storage unit price of Party A that is applied to Party A's customers. This storage cost that will be deducted directly from the invoice for this Purchase Order or from any other payments of the Purchase Order that duly signed by both parties.

ARTICLE 5: PACKING

5.1 Goods supplied under this Purchase Order shall be packed in accordance with international standard for export packing to ensure safety of Goods from damages and corrosion during transportation and suitable for crane operations and handling.

5.2 Before packing, all metal parts of Goods must be preserved with proper grease and wrapped in waterproof strong paper to ensure protection from any damage and corrosion during their transportation and storage in Buyer's country within the guarantee period.

5.3 The Seller shall provide for each package a detailed packing list in English indicating the Purchase Order number, description of items, gross and net weight. One copy of the packing list in a waterproof envelope shall be put into each case with the Goods, the other copy should be fastened to the outer side of the wooden case and shall be covered with a metal plate nailed to the case. For steel cases, both copies of the packing list should be put into the cases.

5.4 The Seller shall be fully responsible for loss, damage of breakage of the Goods and/or rusting/corrosion resulting from defective or inadequate packing.

ARTICLE 6: MARKING

6.1 Marking shall be done in three sides of each case containing Goods, on the two opposite sides and on the top and contain the following information in the English language:

Shipper:
Consignee: VIETSOVPETRO
105 Leloi Street, VungTau, S.R.VietNam
Purchase Order No.
Case No. /
Dimensions: Length x Width x Height in cm
Gross WEIGHT (KGS)
Net Weight (KGS)
Airport/Port of Destination

6.2 The marking must be clearly done by indelible paint and not less than 5 (five) cm high, unless restricted by the size of the case. Where necessary, the Seller shall conspicuously mark on the side of the case appropriate international marks according to the different characteristics, the special marking "Top", "Bottom", "Handle with care", handling places for reloading.

6.3 For the oversized cases (more than 10M long), as well as for the case weighing 500 kgs and more, or if the height of the case exceeds one meter, the center of gravity shall be clearly shown with bright indelible paint with sign (+) on the end and side faces of the cases.

6.4 The case number shall be indicated by a fraction, the numerator shows the ordinal number of the cases, and the denominator indicates the overall quantity of the cases into which completely delivered Goods are packed.

6.5 The Seller shall be responsible for any kind of losses and/or damages of the Goods during loading and unloading as well as for its transportation as a consequence of improper or insufficient marking, as well as for any extra transportation and warehouse expenses, losses connected with misaddressed delivery of the Goods due to incomplete marking.

ARTICLE 7: PAYMENT CONDITIONS

By T/T:

7.1 One hundred percent (100%) of shipment value (after deducting the related fees as in Articles 3.2 above) shall be paid by Telegraphic Transfer to the Seller's account within thirty (30) days from the date of the Certificate of quantity and condition issued by Independent Inspection Company at Buyer's warehouse after receipt of the Goods and a full sets of documents above mentioned in Articles 4.

7.2 Transfer fee shall be on the Buyer's account.

7.3 All the banking fees, including bank commission and other charges associated with the advising and corresponding bank shall be on the Seller's account.

7.4 All charges in connection with the change of payment's form/ conditions (whether occurred inside or outside S.R. Vietnam), due to Seller's/Buyer's request, shall be at the Seller's / Buyer's account.

7.5 The Seller provides Seller's bank account number.

By L/C:

7.6 As soon as possible, but not later than fifteen (15) days after the date of Seller's reconfirmation the Buyer will open through the Bank for Foreign Trade of Vietnam, Vung Tau Branch (Vietcombank Vung Tau) or other bank in Vietnam the Irrevocable and Unconfirmed Letter of Credit in favour of the Seller covering the total Purchase Order value with the content as per Appendix No. 03 which is to be considered as an integral part of this Purchase Order.

The validity of the Letter of Credit shall cover the Delivery Date plus 21 days.

7.7 Payment under this Letter of Credit shall be made for shipment and in the following installments to the Seller:

7.7.1 First Installment: 90% (Ninety percent) of the shipment value shall be made upon presentation of the following documents in English language by the Seller to the Bank:

1. ***Clean on board Bill of Lading*** evidencing shipment from …. port with destination Vietsovpetro Port, Vungtau City, S.R.Vietnam, consignee: Vietsovpetro 105 Le Loi Street, Vungtau City, S.R. Vietnam, marked "Freight prepaid": 02 Surrenders and 02 copies.

2. ***Detailed Packing List*** showing the content of each case or lot, gross and net weight: covering Goods as specified in Appendix No. 01 to this Purchase Order: 02 originals and 02 copies.

3. ***Signed Commercial Invoice*** issued by the Seller for the respective shipment value indicating CFR Vietsovpetro Port, HCM City, S.R.Vietnam, with itemized and total prices: 02 originals and 02 copies.

4. ***Certificate of Origin*** issued by the Commerce Department of Manufacturer's country or Exporter's country: 02 originals / electronic provided web-link to check and 02 copies.

5. ***Certificate of Quality and Quantity*** issued by manufacturer: 02 originals and 02 copies.

6. ***Other Certificates*** as stipulated in Technical Requirements: 02 originals and 02 copies.

7. ***Certificates of Guarantee*** issued by the Seller for the quality of Goods for the period of 18 months from the date of signing the Acceptance Protocol or 12 months from the date that the goods is put in in-service use, whichever is earlier: 02 originals and 02 copies.

8. ***Export License*** or ***Letter of the Seller*** stating that Export License is not necessary for export: 02 originals and 02 copies.

9. ***Seller's fax*** advising the shipment details (Invoice value, Bill of Lading date) to Vietsovpetro: 01 copy.

All the documents presented by the Seller to the Bank shall be duly certified by the Seller as correct, due and payable under the terms and conditions of the Letter of Credit.

Payment for incomplete delivery will not be allowed.

7.7.2 Second Installment: Ten percent (10%) of shipment value shall be payable against confirmation of the Buyer to the Bank within 30 days after the date of the Certificate of quantity and condition issued by Independent Inspection Company at Buyer's warehouse and Invoice. Based on inland transportation costs, Vietsovpetro will calculate and deduct difference amount as stated at Point 3.2 – Article 3 (if any).

7.8 The Letter of Credit shall be subject to the Uniform Customs and Practice for Documentary credit of International Chamber of Commerce (UCP No. 600), 2007 revision.

7.9 All the banking fees, including bank commission charges and other charges associated with the opening bank shall be on the Buyer's account.

7.10 All the banking fees, including bank commission charges and other charges associated with the advising and corresponding bank shall be on the Seller's account.

7.11 All charges in connection with the amendments of the Letter of Credit (whether occurred inside or outside S.R. Vietnam), due to Seller's/Buyer's request, shall be at the Seller's/ Buyer's account.

7.12 All charges associated with any extension of the Letter of credit arising due to delay in delivery as stated in Article 3 of this Purchase Order shall be at the Seller's account.

7.13 The Letter of Credit is to be automatically cancelled within 15 days from the date of opening, if the Buyer does not receive the original Performance Bond in favour of the Buyer with the content as stated in Appendix No. 03 of this Purchase Order.

ARTICLE 8: GOODS'S SURVEY

8.1 The survey at Buyer's warehouse of the received Goods shall be made by Independent Inspection Company with issuing a Certificate of quantity and condition.

8.2 The Certificate of quantity and condition issued by Independent Inspection Company for the Goods supplied under this Purchase Order at Buyer's warehouse shall be legal document for Buyer to make claim to the Seller.

ARTICLE 9: GUARANTEE

9.1 The Seller guarantees that the Goods supplied under this Purchase Order shall be of the highest quality and designed standard as set in Manufacture's country for that type of Goods and shall meet current technological achievements as required, and shall be suitable for normal operation in tropical area condition regarding environment temperature up to 45 Deg. C, humidity up to 100%.

9.2 Proper material of high quality shall be used for manufacturing the Goods to be supplied under this Purchase Order, and the Seller guarantees that the Goods and its quality, quantity shall be fully in compliance with the technical specifications and scope of supply as mentioned in Article 1 to this Purchase Order.

9.3 The Seller guarantees normal operation of all Goods to be supplied under this Purchase Order 18 months from the date of signing the Acceptance Protocol or 12 months from the date that the goods is put in in-service use, whichever is earlier.

9.4 Should the Buyer reveal any defect within the guarantee period or if the quality of Goods supplied under this Purchase Order is not in compliance with terms and conditions of this Purchase Order and its appendices, the Buyer shall notify the Seller by fax of such defect. To substantiate the claims the Buyer shall submit to the Seller the official inspection report issued by Independent Inspection Company. The report of quality issued by Independent Inspection Company shall be legal document for Buyer to make claim to the Seller.

Any claim relating to defects or non-conformity, which occurred during the guarantee period of the Goods with the technical conditions as stated in the Appendix No. 01 shall be submitted to the Seller not later than three months after expiration of the guarantee period.

9.5 The Seller shall inform the Buyer about the results of consideration of claim not later than 14 days after receipt of the Buyer's claim fax and the Seller shall eliminate the revealed defects, at his own expenses, at the Buyer's first request without any delay, but not later than 15 days after receipt of the Buyer's claim fax and/or replace the defective parts or the missing parts by the new ones of good quality on the condition CIF Vietsovpetro port (or CIP Tan Son Nhat airport), S.R. Vietnam. All charge associated with return of the defective Goods to the Seller and delivery the new one to Buyer shall be at the Seller's account.

9.6 Should the Seller fail to eliminate the defects as claimed, or fail to deliver new Goods within the stipulated time in Article 9.5, the Buyer shall charge to the Seller the agreed and liquidated damages at the rate as per Article 10, the period of the above penalty shall be counted from the date of which the Seller receives the Buyer's official claim to the date of elimination of the defects or to the delivery date of the new replacement Goods minus 15 days or the Buyer shall have the right to eliminate such defects at the Seller's expenses

without prejudice to its right in respect of the guarantee, and the Seller undertakes to defray at fist Buyer's request all actual expenses incurred in respect of such elimination and the agreed and liquidated damages at the rate 08% value of non-used Goods due to defect found. Small defects not requiring the Seller's participation and/or permitting no delay will be eliminated by the Buyer and charged at normal costs to the Seller.

9.7 The guarantee period for replaced part shall be equal to that indicated in Article 9.3 and the guarantee period for Goods will be extended by the time during which it was not used due to defect found.

9.8 When the elimination and/or replacement is made and all related costs, expenses are settled, the claim is to be considered as finally settled.

All the claim amount, for which the Seller is to be responsible to the Buyer under this Purchase Order may be deducted by the Buyer from the payment of the Purchase Order value or may be covered by act of law or otherwise from the Seller to be agreed by both **parties.**

ARTICLE 10: AGREED AND LIQUIDATED DAMAGES

10.1. The Seller must deliver goods in full group as specified in Appendix 01 and by the date as stipulated in the Purchase Order. If delayed in delivery the Seller shall pay to the Buyer the agreed and liquidated damages as follows:

- Delay in the first four weeks: 1.00% of breached purchase order value per week

- Delay in each following week: 1.50% of breached purchase order value per week.

When calculating the amount of the agreed and liquidated damages: One week is to be defined as 07 days with 04 days or more than 04 days to be considered as one week, 03 days and less will not be counted. The agreed and liquidated damages calculated on the value of the whole group having delayed items until the total amount of agreed and liquidated damages for delay shall not exceed 08% of breached purchase order value.

If The Seller delivers each group in number of shipments as specified in Appendix 01, then the delivery time of such group shall be counted as the last portion's delivery. Goods of the previous portions are only recorded at the warehouse of the Buyer until the last portion of that group is delivered.

10.2. If The Seller does not deliver the sufficient quantity and types of goods as prescribed in Appendix 01 of this Contract, in that case:

- The Seller shall pay to the Buyer the agreed and liquidated damages an amount equal to 08% of the whole group

If The Seller does not deliver enough quantity and type of goods for each group (as specified in Appendix 01 of this Contract):

- The Buyer has the right to refuse the entire group. The Seller shall pay to the Buyer the agreed and liquidated damages an amount equal to 08% of the whole group.

Or;

- The Buyer has the right to receive the delivered goods of the group, then, the Seller shall pay to the Buyer the agreed and liquidated damages an amount equal to 08% of the whole group.

10.3. If the number of shipments exceeds the ones prescribed in Article 3, then the Seller is responsible for paying the extra costs for the exceeded shipments according to the prevailing prices which are applied by the Buyer to the current customers.

10.4. If the supplied goods do not conform to the quality as specified in Article 2 of the Purchase Order, the Buyer shall be entitled to refuse those Goods and payment of the Purchase Order, the Seller shall pay to the Buyer the agreed and liquidated damages as stipulated in

Article.10.2. The Buyer shall be entitled to accept / not accept that the Seller will provide new goods to replace the defective ones.

10.5. Delay in delivery / insufficient quantity:

10.5.1. If delay in delivery exceeds 60 calendar days against the stipulated date as in Article 3.1 of this Purchase Order, except the Force majeure circumstances, the Buyer shall be entitled to:

a) Appoint a third party capable of providing goods/ goods with services. In that case, The Seller is responsible for signing a contract with that appointed party to continue performing the work.

Or;

b) Directly enter into contract with that third party buying goods / goods and services to continue performing the contract work. In that case, The Seller must pay the difference amount and other related costs and charges (if any).

Or;

c) Unilaterally terminate the Purchase Order and in this case The Seller shall pay to the Buyer the agreed and liquidated damages an amount equal to 08% of the breached Purchase Order value.

10.5.2. If the Seller delayed in delivery of one portion more than 60 calendar days as specified in Article 3.1 of this Purchase Order except the Force majeure circumstances, the Buyer shall be entitled to:

a) Appoint a third party capable of providing goods / goods with services. In that case, The Seller is responsible for signing a contract with the designated party to continue performing the work.

Or;

b) Directly enter into contract with the third party buying goods / goods and services to continue performing the contract work. In that case, The Seller must pay the difference amount and other related costs and charges (if any).

c) Unilaterally terminate the Purchase Order and in this case The Seller shall pay to the Buyer the agreed and liquidated damages an amount equal to 08% of the breached Purchase Order value.

10.6. The total amount of the agreed and liquidated damages should not exceed 08% the Purchase Order value.

10.7. The amount of the agreed and liquidated damages stated in Article 10 of this Purchase Order is exclusive of VAT and import tax.

10.8. The Buyer shall be entitled to :

1) Deduct the amount of agreed and liquidated damages from the payment for this Purchase Order or from any payment for other Purchase Order (if any) between both sides.

2) Request the Seller's issuing Bank to pay the amount equal to the Performance Bond's value;

3) The Buyer shall make a written request to the Seller for the amount of agreed and liquidated damages payment. In all cases, The Seller should have to make commitment to the Buyer for the agreed and liquidated damages payment.

10.9. Any compensation for damage (if any) other than the liquidated damages agreed above shall be made in accordance with the law of Vietnam.

ARTICLE 11: PERFORMANCE BOND

11.1 As soon as possible within 07 (seven) calendar days from the date signing Purchase order (specified on page 01 of the Purchase Order), the Seller shall inform the Buyer by fax of the issuance of the Performance Bond covering eight percent (08%) of the Purchase Order amount, issued by the banks/branches legally operated in Vietnam, acceptable to the Buyer, informing the number, date of issue and full content. In case the Performance Bond issued by the banks/branches legally operated in Vietnam, the Seller shall ensure that the issuing Bank will send to the Buyer the original Performance Bond through Vietcombank Vung Tau Branch.

The content of the Performance Bond shall be in conformity with the Appendix No. 02 of this Purchase Order.

All costs relating to the Performance Bond shall be at Seller's account.

11.2 Should the Buyer not receive the valid, satisfactory Performance Bond within 30 days from the Purchase Order signing date, the Buyer has the right to cancel the Purchase Order at any time and withdraw the Bid Bond without recourse to the law court or to arbitration.

11.3 Should the validity of the Performance Bond be required to be extended (due to delay or extension of Delivery Date of Goods) Seller shall immediately instruct the Issuing Bank to make amendment to the Performance Bond. At the same time, send Buyer the original Performance Bond that has been extended no later than 07 working days before the old Performance Bond expires. Such amendment shall be advised by the Issuing Bank to Buyer through Vietcombank Vung Tau Branch.

11.4 Should the Buyer make use of Performance Bond, it will immediately send to the Seller copy of declaration to the bank.

ARTICLE 12: FORCE-MAJEURE

12.1 A force majeure means an event which occurs objectively and unpredictably and cannot be overcome though all necessary measures have been applied and all the permitted capabilities have been used i.e. war, rebel, army conflicts, embargo, natural calamities (floods, fires, quakes, tsunami …), fire, diseases (Epidemic, Pandemic) published by WHO/Country, blockade announcements applied through Regional/National level by Government.

12.2 The Party who not be able to perform the obligations due to the directly impact of above force majeure shall notify to the other party immediately, including to furnish information, justification proving that the aforementioned force majeure are the main causes that effect of those obligations in the Contract, and evidences that are showing all actions has been made to remedy problem and reduce damages. Any delay in providing information, notice and justification up to 10 days upon the occurring of force majeure events could not be considered as exemption from the related Party's responsibility thereafter due to the force majeure.

12.3 The confirmation of Chamber of Commerce and Industry of Vietnam or authority department at the place where force majeure occurs is the evidence of happening force majeure and when it occurs.

12.4 If in the extent of performing obligations of one Party is hindered in whole or in part due to the above force majeure, then the duration of this Contract shall be extended to cover for the same period when force majeure occurs.

12.5 In case the force majeure lasts accumulated up to 02 months, each party reserves the right to terminate this Contract without any compensation to the other part.

12.6 The other event such as lack of material, electricity, personnel… is not considered as force majeure and not exempt from Party B's obligations in delivery or due to late delivery. Information from newspaper, website and other social media are for reference purpose only.

ARTICLE 13: LAW AND ARBITRATION

13.1 This Purchase Order is governed and construed in accordance with the law of Vietnam.

13.2 Any disputes or discrepancies, which may arise out from this Purchase Order, shall be settled smoothly, amicably, basing on mutual benefit and mutual understanding.

13.3 All disputes arising out of or in relation to this Purchase Order shall be finally settled by Arbitration at the Vietnam International Arbitration Center (VIAC) in accordance with its rules of arbitration.

The number of arbitrators shall be three.

The place of the arbitration shall be Hanoi.

The applicable law shall be the law of Vietnam.

The language of arbitrator shall be Vietnamese.

13.4 Decision / award of the arbitration shall be final and binding upon both parties. The losing party will bear the arbitration fees.

ARTICLE 14: OTHER CONDITIONS

14.1 Any amendment or supplement of this Purchase Order shall be valid only if they are made in writing and signed by both parties.

14.2 Neither party shall be entitled to transfer its rights and obligations under this Purchase Order to any third party without the prior consent in writing of the other party.

14.3 All taxes, duties, custom fees in connection with the execution of this Purchase Order levied inside S.R. Vietnam but exception of Seller's personnel income tax and FCWT shall be at Buyer's account.

14.4 This Purchase Order shall come into force from the date of Seller's reconfirmation, which should be received by the Buyer within 07 days of this Purchase Order date and the Purchase Order will be terminated upon fulfillment by both parties all their obligations as per stipulated in this Purchase Order.

14.5 This Purchase Order is made in English and consists of … pages, including Appendices No. 01, 02, 03 and 04 which are considered as integral parts of this Purchase Order (Appendix No. 01: Scope of Supply and Price Table, Appendix No. 02: Performance Bond, Appendix No. 03: Letter Of Credit Specimen and Appendix No. 04 (A, B): Form of Purchase Order Transaction).

14.6 This Purchase Order is made in 05 originals of the same value, one of which retained by the Seller and three are retained by the Buyer.

14.7 Components of Purchase Order and legal order of precedence are as Clause 2 GCC.

We confirm that all of above mentioned terms and conditions of this Purchase Order are considered as terms and conditions of a Purchase Order signed by and between two our companies.

This is an operative instrument, no mail/airmail will be followed.

Best regards,

FOR VIETSOVPETRO

Appendix No. 01 to the Purchase Order No. ……

SCOPE OF SUPPLY AND PRICE TABLE

This appendix is based on requirements stated in the Invitation to Bid, Bid Proposal and agreements achieved during negotiations and finalizing Purchase Order including price (extended price) for each group and scope of supply. Price (extended price) for each group and scope of supply has included all tax, fees and charges (if any) in accordance with tax rate, fee and charge at the time of 28 days prior to bid closing time of bid proposal.

GOODS PRICE TABLE

(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
No.	**Description**	**Unit**	**Qty**	**Model, Code, Part number**	**Manufacturer**	**Origin**	**Unit Price (USD)**	**Extended Price (USD) (Column 4x8)**
1.	Item 1							M1
2.	Item 2							M2
	…							…
n	Item n							Mn
Total price in CFR Vietsovpetro port (USD)								**M=M1+M2+...Mn**

LEGAL REPRESENTATIVE OF THE BUYER
[Full name, title, signature and stamp]

LEGAL REPRESENTATIVE OF THE SELLER
[Full name, title, signature and stamp]

Appendix No. 02 to the Purchase Order No. ……

PERFORMANCE BOND

_____, day _____ month _____ year _____

TO: _____ *[name of the Employer]*

(Hereinafter referred to as the "Employer")

With reference to Purchase Order No. _____ entitled _____ *(hereinafter referred to as "the Purchase Order")* entered into on the _____ by and between _____, having address at _____ *(hereinafter referred to as "APPLICANT")* and _____, we, _____, having registered office at _____ *(hereinafter referred to as "GUARANTOR")* hereby open in the favor of _____ *(Hereinafter referred to as the "BENEFICIARY")* an unconditional and irrevocable bank guarantee for the amount of _____ (In words: _____) *(hereinafter referred to as "GUARANTEE").*

This GUARANTEE is effective from the issuance date and shall remain valid, binding and in force until _____, hereinafter referred to as "the **Expiry Date**". For any extensions, renewals, or assignments of the Purchase Order beyond the time stated in this GUARANTEE, BENEFICIARY shall not be required to give notice to nor obtain the consent of GUARANTOR. This GUARANTEE would be extended upon written request of APPLICANT to cover the extension, renewal or assignment periods.

GUARANTOR hereby **unconditionally and irrevocably** guarantees to promptly pay BENEFICIARY an amount or amounts, specified by BENEFICIARY, up to the amount stated above, within 05 working days upon our receipt of BENEFICIARY's written demand stating that APPLICANT has failed to fulfill its performance obligation(s) under the Purchase Order.

After the Expiry date, this GUARANTEE shall automatically become null and void, whatsoever and irrespective of whether this GUARANTEE is returned to GUARANTOR or not.

The said guarantee amount shall be paid by GUARANTOR forthwith to BENEFICIARY notwithstanding any contestation or protest by APPLICANT or by GUARANTOR or by any third party, and irrespective of whether or not there is any dispute between APPLICANT and BENEFICIARY in respect of or relating to the Purchase Order or in respect of any other matter and irrespective of whether or not such said dispute, if any, has been settled, resolved, litigated, or adjudicated upon otherwise howsoever.

Neither alteration, variation, incorrect payment, extension in terms of the Purchase Order nor any forbearance of forgiveness in or in respect of any matter or thing concerning the Purchase Order on the part of BENEFICIARY shall in any way release GUARANTOR or APPLICANT or from any liabilities under this GUARANTEE.

Multiple demands under this Guarantee are allowed. In such event, the Guarantee Amount aforementioned shall automatically be reduced by the amount of each and any payment made by us under this Guarantee.

The Guarantee shall be governed by and construed in accordance with the laws of Vietnam. Any dispute arising out of or relating to this Guarantee shall be submitted to [the jurisdiction of competent People's Court of Vietnam in accordance with the governing law] / [arbitration by the Vietnam Arbitration Center international (VIAC) at the Vietnam Chamber of Commerce and Industry in accordance with its rules of arbitration].

This GUARANTEE is issued solely in 01 (one) bilingual original (Vietnamese and English) and is not transferrable. Should there be any inconsistence between the two languages of this GUARANTEE, the Vietnamese content shall prevail and be final.

LEGAL REPRESENTATIVE OF THE BANK

[Full name, title, signature and stamp]

Appendix No. 03 to the Purchase Order No. ……

LETTER OF CREDIT SPECIMEN

SUBJECT:

KIND OF L/C: IRREVOCABLE UNCONFIRMED L/C, AT SIGHT.

APPLICANT: VIETSOVPETRO

(THE BUYER) 105 Le Loi Str., HoChiMinh City, S.R. Vietnam

BENEFICIARY:

(THE SELLER)

ADVISING BANK:

AMOUNT: _____ USD

(In words: United State Dollars _____) – CFR Vietsovpetro port, HoChiMinh City, S.R. Vietnam.

VALIDITY: The validity of the Letter of Credit shall cover the Delivery Date plus 21 days.

PAYMENT CONDITIONS:

Payment under this Letter of Credit shall be made for shipment and in the following installments:

I. First Installment: 90% (Ninety percent) of the shipment value shall be made upon presentation of the following documents in English language by the Seller to the Bank:

1. ***Clean on board Bill of Lading*** evidencing shipment from …. port with destination Vietsovpetro Port, Vungtau City, S.R.Vietnam, consignee: Vietsovpetro 105 Le Loi Street, HCM City, S.R. Vietnam, marked "Freight prepaid": 02 Surrenders and 02 copies.

2. ***Detailed Packing List*** showing the content of each case or lot, gross and net weight: covering Goods as specified in Appendix No. 01 to this Purchase Order: 02 originals and 02 copies.

3. ***Signed Commercial Invoice*** issued by the Seller for the respective shipment value indicating CFR Vietsovpetro Port, HCM City, S.R.Vietnam, with itemized and total prices: 02 originals and 02 copies.

4. ***Certificate of Origin*** issued by the Commerce Department of Manufacturer's country or Exporter's country: 02 originals / electronic provided web-link to check and 02 copies.

5. ***Certificate of Quality and Quantity*** issued by manufacturer: 02 originals and 02 copies.

6. ***Other Certificates*** as stipulated in Technical Requirements: 02 originals and 02 copies.

7. ***Certificates of Guarantee*** issued by the Seller for the quality of Goods for the period of 18 months from the date of signing the Acceptance Protocol or 12 months from the date that the goods is put in in-service use, whichever is earlier: 02 originals and 02 copies.

8. ***Export License*** or ***Letter of the Seller*** stating that Export License is not necessary for export: 02 originals and 02 copies.

9. ***Seller's fax*** advising the shipment details (Invoice value, Bill of Lading date) to Vietsovpetro: 01 copy.

II. Second Installment: Ten percent (10%) of shipment value shall be payable against confirmation of the Buyer to the Bank within 30 days after the date of the Certificate of quantity and condition issued by Independent Inspection Company at Buyer's warehouse.

The Letter of Credit shall be subject to the Uniform Customs and Practice for Documentary credit of International Chamber of Commerce (UCP No. 600), 2007 revision.

All the banking fees, including bank commission charges and other charges associated with the opening bank shall be on the Buyer's account.

All the banking fees, including bank commission charges and other charges associated with the advising and corresponding bank shall be on the Seller's account.

All charges in connection with the amendments of the Letter of Credit (whether occurred inside or outside S.R. Vietnam), due to Seller's/Buyer's request, shall be at the Seller's / Buyer's account.

All charges associated with any extension of the Letter of Credit arising due to delay in delivery as stated in Article 3 of this Purchase Order shall be at the Seller's account.

COVERING:

Scope of supply, specifications, Quantity and Prices are in accordance to Appendix No. 01 of Purchase Order No. _____

SHIPMENT:

Shipment to be made from _____ Port to Vietsovpetro Port, HoChiMinh City, S.R. Vietnam on the terms of ..... – Incoterms 2020.

Delivery date: Group 1: not later than 120 calendar days and Group 2: not later than 84 calendar days from the date of issuing Letter of Award (LOA) to the date that the Goods arrival at Vietsovpetro's port (included navigation and transportation time).

Earlier shipment is allowed.

Partial shipment is allowed.

Transshipment and multimodal transport are allowed at Seller's care and account.

The date of arrival mention here will following the date of arrival of the Goods at Vietsovpetro port, HoChiMinh City, S.R. Vietnam that indicated in "Arrival Notice" of Vessel Agent.

PACKING AND MARKING: As per Purchase order No. __ dated _____

SPECIAL CONDITIONS:

Agreed and liquidated damages for delay of delivery:

Shipment after above stated delivery date is allowed but not exceeds two months. For Bill of Lading dated after delivery date, Buyer's Bank is authorized to deduct the agreed and liquidated damages amount following the whole Purchase order be delay as follows:

- Delay in the first four weeks: 1.00% of breached purchase order value per week.

- Delay in each following week: 1.50% of breached purchase order value per we

One week is to be defined as 07 days, 04 days or more than 04 days to be considered as one week, 03 days and less will not be counted.

Total agreed and liquidated damage amount does not exceed 8% of breached purchase order value.

The Letter of Credit is to be automatically cancelled within 15 days from the date of opening, if the Buyer does not receive the original Performance Bond in favour of the Buyer with the content as stated in Appendix No. 2 of this Purchase Order.

Appendix No. 04A to the Purchase Order No. ……

SAMPLE LETTER OF TRANSACTION PERFORMANCE PURCHASE ORDER

Date month year 20...

To:	Vietsovpetro
	105 Le Loi – Vung Tau Ward – Ho Chi Minh City
Fax:	84 254 3839 857
Recipient:	Tran Quoc Thang – Deputy General Director
Copy:	Nguyen Thi Van Anh – Manager of Commercial Department
Email:	vspadmin@vietsov.com.vn, ...@vietsov.com.vn

(Write the transaction content of: Change of Goods / Services, progress, use of Quota, contents related to the Purchase Order value, payment .....)

REPRESENTATIVE OF PARTY …

(Sign and Stamp)

Appendix No. 04B to the Purchase Order No. ……

SAMPLE LETTER OF TRANSACTION PERFORMANCE PURCHASE ORDER

Date month year 20...

To:	Vietsovpetro
	105 Le Loi – Vung Tau Ward – Ho Chi Minh City
Fax:	84 254 3839 857
Recipient:	Vietsovpetro Commercial Department / Vietsovpetro Port & Logistics Division / Offshore Contruction Division
Email:	vspadmin@vietsov.com.vn, ...@vietsov.com.vn

(Write the transaction content of: Notification of delivery, documentation of goods, notification of commencement of service / construction, information on personnel / equipment for service / construction ...

REPRESENTATIVE OF PARTY….

(Sign and Stamp)

ĐIỀU KIỆN CHUNG CỦA HỢP ĐỒNG (ĐKC)

1. Định nghĩa

Trong Hợp đồng này, các từ ngữ dưới đây được hiểu như sau:

1.1. "Chủ đầu tư" là Liên doanh Việt – Nga Vietsovpetro – Hợp đồng Dầu khí Lô 04-3 được quy định tại **Hợp đồng**;

1.2. "Hợp đồng" là thỏa thuận giữa Chủ đầu tư và Nhà thầu, thể hiện bằng văn bản, được hai Bên ký kết, bao gồm cả các Phụ lục và các tài liệu kèm theo;

1.3. "Nhà thầu" là Nhà thầu trúng thầu (có thể là Nhà thầu độc lập hoặc liên danh) và được quy định tại **Hợp đồng**;

1.4. "Nhà thầu phụ" là Nhà thầu có tên trong danh sách các Nhà thầu phụ do Nhà thầu đề xuất trong Hồ sơ dự thầu và được Nhà thầu ký Hợp đồng để thực hiện dịch vụ liên quan;

1.5. "Tài liệu Hợp đồng" là các tài liệu được liệt kê trong Hợp đồng, bao gồm bất kỳ bản sửa đổi, bổ sung nào của Hợp đồng;

1.6. "Giá Hợp đồng" là tổng số tiền ghi trong Hợp đồng cho việc cung cấp hàng hóa và dịch vụ liên quan. Giá Hợp đồng đã bao gồm tất cả các chi phí về thuế, phí và lệ phí (nếu có);

1.7. "Ngày" là ngày dương lịch; "năm" là 365 ngày;

1.8. "Hàng hóa" bao gồm máy móc, thiết bị, nguyên liệu, nhiên liệu, vật liệu, vật tư, phụ tùng; hàng tiêu dùng; trang thiết bị y tế dùng cho các cơ sở y tế;

1.9. "Dịch vụ liên quan" bao gồm các dịch vụ như lắp đặt, duy tu, bảo dưỡng, sửa chữa ban đầu, bảo hiểm lắp đặt, bảo hiểm sửa chữa hoặc cung cấp các dịch vụ sau bán hàng khác như đào tạo, chuyển giao công nghệ, …;

1.10. "Hoàn thành" là việc Nhà thầu hoàn tất các dịch vụ liên quan theo các điều khoản và điều kiện quy định tại Hợp đồng;

1.11. "Địa điểm dự án" là địa điểm được quy định tại **Hợp đồng**.

2. Tài liệu Hợp đồng và thứ tự ưu tiên

2.1. Tất cả các tài liệu nêu tại Mục 2.2 ĐKC (bao gồm cả các phần của tài liệu) sẽ cấu thành Hợp đồng để tạo thành thể thống nhất, có tính tương hỗ, bổ sung và giải thích cho nhau.

2.2. Hợp đồng, các tài liệu và thứ tự ưu tiên pháp lý như sau:

a) Hợp đồng (kèm theo các Phụ lục Hợp đồng);

b) Biên bản thương thảo, hoàn thiện Hợp đồng;

c) Báo cáo phê duyệt kết quả lựa chọn nhà thầu;

d) Điều kiện chung của Hợp đồng;

đ) Hồ sơ dự thầu của Nhà thầu trúng thầu;

e) Hồ sơ mời thầu và các tài liệu sửa đổi Hồ sơ mời thầu.

3. Luật và ngôn ngữ

Luật điều chỉnh Hợp đồng là luật Việt Nam, ngôn ngữ của Hợp đồng là tiếng Việt.

4. Thông báo

4.1. Bất cứ thông báo nào của một Bên gửi cho Bên kia liên quan đến Hợp đồng phải được thể hiện bằng văn bản, theo địa chỉ quy định tại **Hợp đồng**. Thuật ngữ "bằng văn bản" có nghĩa là hình thức truyền đạt thông tin dưới dạng viết và có bằng chứng về việc tiếp nhận thông tin.

4.2. Thông báo của một Bên sẽ được coi là có hiệu lực kể từ ngày Bên kia nhận được hoặc theo ngày hiệu lực nêu trong thông báo, tùy theo ngày nào đến muộn hơn.

5. Bảo đảm thực hiện Hợp đồng

5.1. Bảo đảm thực hiện Hợp đồng phải được nộp lên Chủ đầu tư không muộn hơn ngày quy định tại Thư chấp thuận Hồ sơ dự thầu và trao Hợp đồng. Bảo đảm thực hiện Hợp đồng được thực

hiện bằng một trong các hình thức sau:

a) Nộp thư bảo lãnh của tổ chức tín dụng trong nước, chi nhánh ngân hàng nước ngoài được thành lập theo pháp luật Việt Nam;

b) Nộp giấy chứng nhận bảo hiểm bảo lãnh của doanh nghiệp bảo hiểm phi nhân thọ trong nước, chi nhánh doanh nghiệp bảo hiểm phi nhân thọ nước ngoài được thành lập theo pháp luật Việt Nam.

Bảo đảm thực hiện Hợp đồng theo quy định tại Điểm a và Điểm b Khoản này là bảo đảm không có điều kiện (trả tiền khi có yêu cầu), theo mẫu quy định tại Phần 4 hoặc một mẫu khác được Chủ đầu tư chấp thuận.

c) Hình thức khác được Chủ đầu tư chấp thuận quy định tại **Hợp đồng.**

5.2. Bảo đảm thực hiện Hợp đồng có giá trị và hiệu lực quy định tại Hợp đồng.

5.3. Bảo đảm thực hiện Hợp đồng sẽ được trả cho Chủ đầu tư để bồi thường cho bất kỳ tổn thất nào phát sinh do Nhà thầu không hoàn thành các nghĩa vụ Hợp đồng.

5.4. Thời hạn hoàn trả bảo đảm thực hiện Hợp đồng theo quy định tại **Hợp đồng**.

6. <u>Ký Hợp đồng thầu phụ</u>

6.1. Nhà thầu được ký kết Hợp đồng với các Nhà thầu phụ trong danh sách các Nhà thầu phụ quy định tại **Hợp đồng** để thực hiện dịch vụ liên quan nêu trong Hồ sơ dự thầu. Việc sử dụng Nhà thầu phụ sẽ không làm thay đổi các nghĩa vụ của Nhà thầu. Nhà thầu phải chịu trách nhiệm trước Chủ đầu tư về khối lượng, chất lượng, tiến độ và các nghĩa vụ khác đối với phần việc do Nhà thầu phụ thực hiện.

Việc thay thế, bổ sung Nhà thầu phụ trong danh sách các Nhà thầu phụ nêu trong Hồ sơ dự thầu hoặc thay đổi nội dung thầu phụ nêu trong Hồ sơ dự thầu chỉ được thực hiện khi được Chủ đầu tư chấp thuận; việc sử dụng Nhà thầu phụ phải phù hợp với nhu cầu của Nhà thầu trong thực hiện Hợp đồng, Nhà thầu phụ phải đáp ứng về năng lực, kinh nghiệm theo yêu cầu của Nhà thầu.

6.2. Nhà thầu có trách nhiệm thanh toán đầy đủ và đúng hạn cho Nhà thầu phụ theo các điều khoản thỏa thuận giữa Nhà thầu và Nhà thầu phụ.

7. <u>Giải quyết tranh chấp</u>

7.1. Chủ đầu tư và Nhà thầu có trách nhiệm giải quyết các tranh chấp phát sinh giữa hai Bên thông qua thương lượng, hòa giải.

7.2. Nếu tranh chấp không thể giải quyết được bằng thương lượng, hòa giải trong thời gian quy định tại **Hợp đồng** kể từ ngày phát sinh tranh chấp thì bất kỳ Bên nào cũng đều có thể yêu cầu đưa việc tranh chấp ra giải quyết theo cơ chế được quy định tại Hợp đồng.

8. <u>Phạm vi cung cấp</u>

Hàng hóa và dịch vụ liên quan phải được cung cấp theo quy định tại **Hợp đồng.**

9. <u>Tiến độ giao hàng, lịch hoàn thành các dịch vụ liên quan (nếu có) và tài liệu chứng từ</u>

Tiến độ giao hàng và lịch hoàn thành các dịch vụ liên quan (nếu có) phải được thực hiện theo quy định tại **Hợp đồng**. Nhà thầu phải cung cấp các hóa đơn, chứng từ tài liệu khác theo quy định tại **Hợp đồng**.

10. <u>Trách nhiệm của Nhà thầu</u>

Nhà thầu phải cung cấp toàn bộ hàng hóa và dịch vụ liên quan (nếu có) trong phạm vi cung cấp quy định tại Mục 8 ĐKC và theo tiến độ giao hàng, lịch hoàn thành các dịch vụ liên quan quy định tại Mục 9 ĐKC.

11. <u>Loại Hợp đồng và giá Hợp đồng</u>

11.1. Loại Hợp đồng: theo quy định tại Hợp đồng.

11.2. Giá Hợp đồng quy định tại Hợp đồng là toàn bộ chi phí để hoàn thành việc cung cấp hàng hóa và dịch vụ liên quan của gói thầu nêu trong bảng giá Hợp đồng trên cơ sở bảo đảm tiến độ, chất lượng theo đúng yêu cầu của gói thầu.

12. <u>Thuế, phí và lệ phí</u>

12.1. Nhà thầu chịu trách nhiệm đối với toàn bộ chi phí về thuế, phí và lệ phí phát sinh cho đến khi hàng hóa được giao cho Chủ đầu tư.

12.2. Trường hợp Nhà thầu thuộc đối tượng được miễn, giảm thuế, phí, lệ phí, Chủ đầu tư tạo điều kiện tối đa cho Nhà thầu áp dụng các chính sách miễn, giảm thuế, phí, lệ phí và được quy định tại Hợp đồng.

12.3. Việc điều chỉnh thuế thực hiện theo quy định tại **Hợp đồng**.

13. Tạm ứng

13.1. Chủ đầu tư phải cấp cho Nhà thầu khoản tiền tạm ứng theo quy định tại **Hợp đồng**, sau khi Nhà thầu nộp Bảo lãnh tạm ứng tương đương với khoản tiền tạm ứng. Bảo lãnh tạm ứng phải được phát hành bởi một tổ chức tín dụng hoặc chi nhánh ngân hàng nước ngoài được thành lập theo pháp luật Việt Nam.

13.2. Nhà thầu chỉ được sử dụng tiền tạm ứng cho việc thực hiện Hợp đồng. Nhà thầu phải chứng minh rằng khoản tiền tạm ứng đã được sử dụng đúng mục đích, đúng đối tượng bằng cách nộp bản sao các hóa đơn chứng từ hoặc tài liệu liên quan cho Chủ đầu tư.

14. Thanh toán

14.1. Yêu cầu thanh toán của Nhà thầu phải được gửi cho Chủ đầu tư bằng văn bản, kèm theo hóa đơn mô tả hàng hóa đã bàn giao và các dịch vụ liên quan đã thực hiện, cùng với chứng từ nộp theo quy định tại Điều 9 ĐKC và gửi yêu cầu thanh toán khi đã hoàn thành các nghĩa vụ khác quy định trong Hợp đồng.

14.2. Việc thanh toán thực hiện theo quy định tại **Hợp đồng**.

14.3. Đồng tiền thanh toán là VNĐ.

15. Quyền tác giả

Quyền tác giả đối với tất cả các bản vẽ, tài liệu và hồ sơ chứa đựng thông tin và dữ liệu mà Nhà thầu đã nộp cho Chủ đầu tư vẫn thuộc về Nhà thầu. Trường hợp các bản vẽ, tài liệu và hồ sơ đó được cung cấp cho Chủ đầu tư một cách trực tiếp hoặc thông qua Nhà thầu bởi một Bên thứ ba thì quyền tác giả đối với các bản vẽ, tài liệu và hồ sơ thuộc về Bên thứ ba đó.

16. Sử dụng các tài liệu và thông tin liên quan đến Hợp đồng

16.1. Chủ đầu tư và Nhà thầu phải bảo mật bất kỳ tài liệu, dữ liệu hoặc thông tin nào khác liên quan đến Hợp đồng do một Bên cung cấp trực tiếp hoặc gián tiếp cho Bên kia, không được tiết lộ tài liệu, dữ liệu hoặc thông tin đó cho Bên thứ ba nếu không có văn bản đồng ý của Bên kia cho dù tài liệu, dữ liệu hoặc thông tin đó được cung cấp trước, trong hoặc sau khi hoàn thành hoặc chấm dứt Hợp đồng. Nhà thầu có thể chuyển cho Nhà thầu phụ các tài liệu, dữ liệu và thông tin phù hợp do Chủ đầu tư cung cấp để Nhà thầu phụ thực hiện công việc của mình theo Hợp đồng; trong trường hợp này, Nhà thầu phụ phải có cam kết với Nhà thầu về việc bảo mật các tài liệu, dữ liệu hoặc thông tin đó.

16.2. Chủ đầu tư không được sử dụng các tài liệu, dữ liệu và thông tin khác nhận được từ Nhà thầu cho bất kỳ mục đích nào khác không liên quan đến Hợp đồng. Nhà thầu không được sử dụng các tài liệu, dữ liệu và thông tin khác nhận được từ Chủ đầu tư cho bất kỳ mục đích nào khác không liên quan đến việc thực hiện Hợp đồng.

16.3. Nghĩa vụ của Chủ đầu tư và Nhà thầu quy định tại Mục 16.1 và Mục 16.2 ĐKC không áp dụng đối với các thông tin sau đây:

a) Thông tin mà Chủ đầu tư hoặc Nhà thầu cần cung cấp cho cấp có thẩm quyền;

b) Thông tin đã hoặc sẽ được công bố mà không phải do lỗi của Chủ đầu tư hoặc Nhà thầu;

c) Thông tin thuộc sở hữu của một Bên vào thời điểm công bố và trước đó không phải do Bên kia cung cấp trực tiếp hoặc gián tiếp;

d) Thông tin mà một Bên nhận được một cách hợp pháp từ một Bên thứ ba không có nghĩa vụ bảo mật thông tin.

16.4. Các quy định tại Mục 16 ĐKC không làm thay đổi bất kỳ cam kết bảo mật nào do một Bên

đưa ra trước ngày ký Hợp đồng liên quan đến việc cung cấp hàng hóa, dịch vụ.

16.5. Các quy định tại Mục 16 ĐKC tiếp tục có hiệu lực sau khi hoàn thành hoặc chấm dứt Hợp đồng vì bất cứ lý do gì.

17. Thông số kỹ thuật và tiêu chuẩn

Hàng hóa và các dịch vụ liên quan được cung cấp theo Hợp đồng sẽ phải tuân theo các thông số kỹ thuật và tiêu chuẩn quy định tại Chương V; nếu tại chương V không quy định đến một thông số hay tiêu chuẩn nào có thể áp dụng thì phải tuân thủ theo thông số và tiêu chuẩn tương đương hoặc cao hơn tiêu chuẩn hiện hành tại quốc gia hoặc vùng lãnh thổ mà hàng hóa có xuất xứ.

18. Đóng gói hàng hóa

18.1. Nhà thầu phải đóng gói hàng hóa đúng yêu cầu nhằm tránh hư hỏng trong quá trình vận chuyển đến địa điểm dự án theo quy định trong Hợp đồng. Trong quá trình vận chuyển, bao gói hàng hóa phải đủ chắc chắn để chịu được những va chạm mạnh, nhiệt độ quá cao hoặc quá thấp, trong nước mặn, nước mưa và ở ngoài trời. Kích thước và trọng lượng của mỗi kiện hàng phải tính đến điều kiện vận chuyển như khoảng cách, phương tiện vận chuyển, điều kiện cơ sở hạ tầng, … từ nơi xuất hàng đến địa điểm dự án.

18.2. Việc đóng gói, ghi chú đối với hàng hóa, các giấy tờ bên trong và bên ngoài kiện hàng phải tuân thủ các yêu cầu cụ thể trong Hợp đồng, bao gồm cả các yêu cầu (nếu có) quy định ở **Hợp đồng** và các chỉ dẫn khác của Chủ đầu tư.

19. Bảo hiểm

Trừ trường hợp có quy định khác tại Hợp đồng, hàng hóa cung cấp theo Hợp đồng phải được bảo hiểm đầy đủ cho các tổn thất, hư hại có thể xảy ra trong quá trình sản xuất hoặc tiếp nhận, vận chuyển, lưu kho và giao hàng theo quy định tại Hợp đồng.

20. Vận chuyển và các dịch vụ phát sinh

20.1. Yêu cầu về vận chuyển hàng hóa và các yêu cầu khác quy định tại **Hợp đồng**.

20.2. Chủ đầu tư có thể yêu cầu Nhà thầu cung cấp một hoặc một số dịch vụ sau đây, bao gồm cả các dịch vụ (nếu có) theo quy định tại **Hợp đồng**:

a) Thực hiện việc lắp đặt hoặc giám sát việc lắp đặt tại hiện trường, chạy thử hàng hóa;

b) Cung cấp các dụng cụ cần thiết để lắp ráp, bảo dưỡng hàng hóa;

c) Cung cấp tài liệu chi tiết hướng dẫn vận hành và bảo dưỡng cho từng loại hàng hóa;

d) Vận hành hoặc giám sát hoặc bảo dưỡng, sửa chữa hàng hóa trong khoảng thời gian đã được các Bên thỏa thuận, với điều kiện là dịch vụ này sẽ không miễn trừ cho Nhà thầu khỏi bất kỳ nghĩa vụ bảo hành nào theo Hợp đồng này;

đ) Hướng dẫn nhân sự của Chủ đầu tư về cách lắp đặt, chạy thử, vận hành, bảo dưỡng, sửa chữa hàng hóa.

20.3. Trường hợp phát sinh dịch vụ ngoài Hợp đồng, Chủ đầu tư và Nhà thầu thương thảo về chi phí thực hiện dịch vụ, bảo đảm không vượt quá mức giá mà Nhà thầu áp dụng cho dịch vụ tương tự trong các Hợp đồng khác.

21. Kiểm tra và thử nghiệm hàng hóa

Nhà thầu phải tiến hành tất cả các thử nghiệm, kiểm tra đối với hàng hóa và dịch vụ liên quan theo quy định tại Hợp đồng và chịu toàn bộ chi phí thử nghiệm, kiểm tra theo quy định của Hợp đồng.

22. Phạt và bồi thường thiệt hại

Phạt vi phạm Hợp đồng và bồi thường thiệt hại theo quy định tại **Hợp đồng**.

23. Bảo hành

23.1. Nhà thầu bảo đảm cung cấp hàng hóa mới, chưa qua sử dụng theo đúng đề xuất đã nêu.

23.2. Nhà thầu bảo đảm hàng hóa không phát sinh khiếm khuyết do bất kỳ hành động hay sơ suất nào từ phía Nhà thầu hoặc do thiết kế, vật liệu hoặc kỹ thuật chế tạo khi hàng hóa được sử dụng bình thường trong các điều kiện phổ biến tại Việt Nam.

23.3. Thời hạn bảo hành và địa điểm áp dụng bảo hành quy định tại **Hợp đồng**.

23.4. Trường hợp phát hiện khiếm khuyết của hàng hóa, Chủ đầu tư kịp thời thông báo cho Nhà thầu, kèm theo tài liệu chứng minh. Chủ đầu tư tạo điều kiện cho Nhà thầu tiến hành kiểm tra các khiếm khuyết đó.

23.5. Sau khi nhận được thông báo của Chủ đầu tư về việc hàng hóa có khiếm khuyết, Nhà thầu phải kịp thời sửa chữa hoặc thay thế hàng hóa có khiếm khuyết trong thời hạn quy định tại **Hợp đồng** và chịu toàn bộ chi phí sửa chữa, thay thế.

23.6. Trường hợp đã được thông báo nhưng Nhà thầu không tiến hành sửa chữa khiếm khuyết của hàng hóa trong thời hạn quy định tại **Hợp đồng**, Chủ đầu tư có thể tự sửa chữa (nếu cần thiết). Nhà thầu phải chịu tất cả rủi ro và chi phí liên quan. Việc Chủ đầu tư tự sửa chữa khiếm khuyết của hàng hóa không ảnh hưởng đến các quyền khác của Chủ đầu tư đối với Nhà thầu theo Hợp đồng.

24. Bồi thường vi phạm sáng chế

24.1. Với điều kiện là Chủ đầu tư tuân thủ Mục 24.2 ĐKC, Nhà thầu có nghĩa vụ bồi thường, bảo đảm Chủ đầu tư và nhân sự của Chủ đầu tư không bị tổn hại bởi bất kỳ vụ kiện tụng, thủ tục hành chính, khiếu nại, yêu cầu, tổn thất, thiệt hại, chi phí nào, bao gồm cả chi phí thuê luật sư vì có vi phạm hoặc cáo buộc vi phạm sáng chế, mẫu hữu ích, kiểu dáng công nghiệp, nhãn hiệu, quyền tác giả hoặc các quyền sở hữu trí tuệ khác đã đăng ký hoặc tồn tại vào ngày ký Hợp đồng mà các vi phạm hoặc cáo buộc vi phạm đó liên quan tới:

a) Việc lắp đặt hàng hóa do Nhà thầu thực hiện hoặc việc sử dụng hàng hóa tại Việt Nam;

b) Việc bán các sản phẩm được sản xuất từ hàng hóa.

Việc bồi thường nêu trên không áp dụng đối với các trường hợp sau: sử dụng hàng hóa hoặc bất kỳ phần nào của hàng hóa ngoài mục đích nêu trong Hợp đồng hoặc phát sinh hợp lý từ Hợp đồng; có hành vi vi phạm do sử dụng hàng hóa hoặc bất kỳ phần nào của hàng hóa, hay bất kỳ sản phẩm nào được sản xuất từ hàng hóa có sự kết hợp các thiết bị, nhà xưởng hoặc vật tư khác không phải do Nhà thầu cung cấp theo Hợp đồng.

24.2. Trường hợp xảy ra kiện tụng hoặc khiếu nại đối với Chủ đầu tư liên quan tới các vấn đề quy định tại Mục 24.1 ĐKC, Chủ đầu tư có nghĩa vụ thông báo kịp thời cho Nhà thầu. Nhà thầu có thể nhân danh Chủ đầu tư giải quyết kiện tụng hoặc khiếu nại đó hoặc thương thảo để giải quyết kiện tụng hoặc khiếu nại đó và chịu trách nhiệm đối với các chi phí liên quan.

24.3. Trong vòng 28 ngày kể từ khi nhận được thông báo của Chủ đầu tư, trường hợp Nhà thầu không thông báo cho Chủ đầu tư về ý định giải quyết kiện tụng hay khiếu nại đó, Chủ đầu tư sẽ tự giải quyết.

24.4. Trường hợp được yêu cầu, Chủ đầu tư hỗ trợ Nhà thầu giải quyết vụ kiện tụng hay khiếu nại đó và sẽ được Nhà thầu hoàn trả mọi chi phí hợp lý phát sinh.

24.5. Chủ đầu tư có nghĩa vụ bồi thường, đảm bảo Nhà thầu, Nhà thầu phụ, nhân sự của Nhà thầu không bị tổn hại bởi bất kỳ vụ kiện tụng, thủ tục hành chính, khiếu nại, yêu cầu, tổn thất, thiệt hại, chi phí nào, bao gồm cả chi phí thuê luật sư vì có vi phạm hoặc cáo buộc vi phạm sáng chế, mẫu hữu ích, kiểu dáng công nghiệp, nhãn hiệu, quyền tác giả hoặc các quyền sở hữu trí tuệ khác đã đăng ký hoặc tồn tại vào ngày ký Hợp đồng mà các vi phạm hoặc cáo buộc vi phạm đó phát sinh từ hoặc liên quan đến bất kỳ thiết kế, dữ liệu, bản vẽ, thông số kỹ thuật hoặc các tài liệu và hồ sơ nào được cung cấp hoặc thiết kế bởi Chủ đầu tư hoặc thay mặt Chủ đầu tư.

25. Thay đổi liên quan đến pháp lý

Trừ trường hợp có quy định khác tại Hợp đồng, kể từ 28 ngày trước ngày có thời điểm đóng thầu trở về sau, nếu có bất kỳ chính sách nào được ban hành, thay thế, sửa đổi hoặc tuyên bố hết hiệu lực tại Việt Nam gây ảnh hưởng đến ngày giao hàng và/hoặc giá Hợp đồng thì ngày giao hàng hoặc giá Hợp đồng phải được điều chỉnh tương ứng với mức độ ảnh hưởng của Nhà thầu khi thực hiện các nghĩa vụ theo Hợp đồng. Phần tăng hoặc giảm giá Hợp đồng không được thanh toán riêng

hay ghi nhận khoản phải trả riêng nếu việc tăng hoặc giảm giá Hợp đồng này đã được quy định tại Mục 11 ĐKC.

26. <u>Bất khả kháng</u>

26.1. Nhà thầu không bị tịch thu bảo lãnh thực hiện Hợp đồng, không phải chịu trách nhiệm bồi thường thiệt hại hay bị phạt hoặc bị chấm dứt Hợp đồng nếu rơi vào các sự kiện bất khả kháng gây cản trở tiến độ thực hiện Hợp đồng hoặc không thể thực hiện nghĩa vụ Hợp đồng.

26.2. Khi xảy ra sự việc bất khả kháng, việc một Bên không thực hiện được bất kỳ một nghĩa vụ nào của mình sẽ không bị coi là vi phạm hay phá vỡ Hợp đồng, với điều kiện Nhà thầu bị ảnh hưởng bởi vụ việc này: (a) đã tiến hành những biện pháp ngăn ngừa hợp lý, cẩn trọng và các biện pháp thay thế cần thiết, tất cả với mục đích thực hiện được những điều khoản và điều kiện của Hợp đồng này, và (b) phải tiếp tục thực hiện các nghĩa vụ của mình trong phạm vi Hợp đồng chừng nào việc thực hiện này còn hợp lý và thực tế.

26.3. Trong Hợp đồng này, bất khả kháng được hiểu là các sự kiện nằm ngoài tầm kiểm soát của các Bên và không thể lường trước, không thể tránh được và khiến cho việc thực hiện Hợp đồng là không khả thi mà nguyên nhân không phải do sơ suất hoặc thiếu chú ý của các Bên. Sự kiện bất khả kháng có thể bao gồm nhưng không giới hạn bởi chiến tranh, bạo loạn, đình công, hỏa hoạn, lũ lụt, dịch bệnh, cách ly do kiểm dịch hoặc các chính sách, quy định của Nhà nước.

26.4. Khi xảy ra sự kiện bất khả kháng, Nhà thầu bị ảnh hưởng bởi sự kiện bất khả kháng phải kịp thời thông báo bằng văn bản cho Bên kia về sự kiện đó và nguyên nhân gây ra sự kiện trong vòng 14 ngày kể từ ngày xảy ra sự kiện bất khả kháng. Đồng thời, chuyển cho Bên kia giấy xác nhận về sự kiện bất khả kháng đó được cấp bởi một tổ chức có thẩm quyền tại nơi xảy ra sự kiện bất khả kháng.

Nhà thầu bị ảnh hưởng bởi sự kiện bất khả kháng phải tiếp tục thực hiện các nghĩa vụ Hợp đồng theo hoàn cảnh thực tế cho phép và phải tìm mọi biện pháp hợp lý để hạn chế hậu quả của sự việc bất khả kháng.

26.5. Thời hạn mà một Bên phải hoàn thành một công việc theo Hợp đồng này được gia hạn thêm một khoảng thời gian bằng đúng thời gian Bên đó không thể thực hiện được công việc do sự kiện bất khả kháng gây ra.

27. <u>Sửa đổi Hợp đồng</u>

27.1. Chủ đầu tư có thể yêu cầu Nhà thầu sửa đổi, bổ sung các nội dung sau đây trong phạm vi công việc của Hợp đồng:

a) Thay đổi bản vẽ, thiết kế công nghệ hoặc yêu cầu kỹ thuật đối với trường hợp hàng hóa cung cấp theo Hợp đồng được đặt hàng sản xuất cho riêng Chủ đầu tư;

b) Thay đổi phương thức vận chuyển hoặc đóng gói;

c) Thay đổi địa điểm giao hàng;

d) Thay đổi dịch vụ liên quan;

đ) Điều chỉnh tiến độ thực hiện Hợp đồng theo quy định tại Mục 28 ĐKC.

27.2. Trường hợp việc sửa đổi, bổ sung các nội dung trong phạm vi công việc của Hợp đồng quy định tại Mục 27.1 ĐKC làm thay đổi chi phí hoặc thời gian thực hiện bất kỳ điều khoản nào trong Hợp đồng, giá Hợp đồng hoặc ngày giao hàng, ngày hoàn thành dịch vụ liên quan phải được điều chỉnh tương ứng và hai Bên tiến hành sửa đổi Hợp đồng. Yêu cầu của Nhà thầu về việc điều chỉnh giá Hợp đồng, ngày giao hàng hoặc ngày hoàn thành phải được tiến hành trong vòng 28 ngày, kể từ ngày Nhà thầu nhận được yêu cầu của Chủ đầu tư về việc sửa đổi, bổ sung nội dung công việc của Hợp đồng.

27.3. Trường hợp Nhà thầu cung cấp hàng hóa với phiên bản mới của cùng hãng sản xuất, có cùng xuất xứ, có tính năng kỹ thuật, cấu hình, thông số, … tương đương hoặc tốt hơn phiên bản hàng hóa Nhà thầu đề xuất trong Hồ sơ dự thầu và đáp ứng yêu cầu Hồ sơ mời thầu thì Nhà thầu phải thông báo trước bằng văn bản cho Chủ đầu tư để Chủ đầu tư xem xét. Trong trường hợp này, căn cứ nhu cầu sử dụng, Chủ đầu tư có thể chấp thuận đề xuất của Nhà thầu với

điều kiện là đơn giá và các điều kiện khác của Hợp đồng không thay đổi.

27.4. Trường hợp cần thực hiện các dịch vụ liên quan chưa nêu trong Hợp đồng, Chủ đầu tư và Nhà thầu tiến hành thương thảo, bảo đảm đơn giá phù hợp giá cả thị trường.

27.5. Chủ đầu tư và Nhà thầu sẽ tiến hành thương thảo để làm cơ sở ký kết văn bản sửa đổi Hợp đồng trong trường hợp sửa đổi Hợp đồng. Mọi giao dịch trong quá trình thực hiện Hợp đồng được các Bên thực hiện bằng văn bản và gửi theo đường bưu chính hoặc theo số Fax tới địa chỉ đăng ký hoặc số Fax của mỗi Bên ghi trong Hợp đồng và email đến địa chỉ email theo mẫu quy định tại **Hợp đồng**.

27.6. Trong thời gian thực hiện Hợp đồng, Nhà thầu có thể đề xuất giải pháp tiết kiệm chi phí bao gồm ít nhất các nội dung sau đây:

a) Nội dung giải pháp, giải thích sự khác biệt so với các yêu cầu theo Hợp đồng đã ký kết;

b) Phân tích toàn diện chi phí và lợi ích của giải pháp bao gồm mô tả và ước tính các chi phí (bao gồm cả chi phí vòng đời) có thể phát sinh cho Chủ đầu tư trong trường hợp chấp thuận đề xuất của Nhà thầu;

c) Tác động của giải pháp đối với hiệu quả thực hiện Hợp đồng.

27.7. Chủ đầu tư có thể chấp thuận đề xuất của Nhà thầu nếu đề xuất này chứng minh được một trong các lợi ích dưới đây mà không làm ảnh hưởng đến các chức năng cần thiết của hàng hóa:

a) Rút ngắn thời gian giao hàng;

b) Giảm giá Hợp đồng hoặc chi phí vòng đời cho Chủ đầu tư;

c) Nâng cao chất lượng, hiệu quả hoặc tính bền vững của hàng hóa trong Hợp đồng;

d) Bất kỳ lợi ích nào khác cho Chủ đầu tư.

Trường hợp đề xuất của Nhà thầu được Chủ đầu tư chấp thuận và làm giảm giá Hợp đồng, Chủ đầu tư thanh toán cho Nhà thầu theo tỷ lệ quy định tại **Hợp đồng** đối với phần giá trị giảm giá Hợp đồng.

Trường hợp đề xuất của Nhà thầu được Chủ đầu tư chấp thuận và làm tăng giá Hợp đồng nhưng giảm chi phí vòng đời do tác động của các yếu tố quy định tại các điểm a, b, c và d khoản này, Chủ đầu tư thanh toán cho Nhà thầu theo phần giá trị tăng giá Hợp đồng.

28. Điều chỉnh tiến độ thực hiện Hợp đồng

28.1. Trong quá trình thực hiện Hợp đồng, trường hợp phát sinh các điều kiện bất lợi, cản trở Nhà thầu hoặc Nhà thầu phụ trong việc cung cấp hàng hóa và lịch thực hiện các dịch vụ liên quan quy định tại Mục 9 ĐKC, Nhà thầu phải kịp thời thông báo bằng văn bản cho Chủ đầu tư về việc chậm tiến độ, nguyên nhân, khoảng thời gian chậm tiến độ. Trên cơ sở thông báo của Nhà thầu, Chủ đầu tư phải nhanh chóng đánh giá tình hình và có thể xem xét gia hạn Hợp đồng. Trường hợp Chủ đầu tư đồng ý gia hạn, các Bên tiến hành thương thảo để làm cơ sở ký kết Phụ lục sửa đổi, Bổ sung Hợp đồng.

28.2. Trừ trường hợp bất khả kháng quy định tại Mục 26 ĐKC, Nhà thầu giao hàng chậm hoặc hoàn thành dịch vụ liên quan chậm có nghĩa vụ bồi thường thiệt hại cho Chủ đầu tư theo quy định tại Mục 22 ĐKC.

29. Chấm dứt Hợp đồng

29.1. Chấm dứt Hợp đồng do sai phạm

a) Chủ đầu tư có thể chấm dứt một phần hoặc toàn bộ Hợp đồng mà không gây tổn hại đến các biện pháp khắc phục vi phạm Hợp đồng khác bằng cách thông báo bằng văn bản cho Nhà thầu về sai phạm trong Hợp đồng trong các trường hợp sau:

(i) Nhà thầu không thể bàn giao hàng hóa hoặc một phần hàng hóa trong thời hạn quy định theo Hợp đồng, hoặc trong thời gian gia hạn theo quy định tại Mục 28 ĐKC;

(ii) Nhà thầu không thực hiện bất kỳ nghĩa vụ nào khác theo Hợp đồng;

(iii) Chủ đầu tư xác định Nhà thầu vi phạm một trong các hành vi bị cấm quy định tại

Hồ sơ mời thầu trong quá trình đấu thầu hoặc thực hiện Hợp đồng;

b) Trường hợp Chủ đầu tư chấm dứt một phần hoặc toàn bộ Hợp đồng theo điểm a khoản này, Chủ đầu tư có thể mua sắm hàng hóa và dịch vụ liên quan tương tự như các hàng hóa và dịch vụ chưa được thực hiện theo các điều khoản và phương thức phù hợp. Nhà thầu phải chịu trách nhiệm bồi thường cho Chủ đầu tư các chi phí phụ trội phát sinh từ việc mua hàng hóa và dịch vụ tương tự đó. Tuy nhiên, Nhà thầu vẫn phải tiếp tục thực hiện phần Hợp đồng không bị chấm dứt.

29.2. Chấm dứt Hợp đồng do mất khả năng thanh toán

Trường hợp Nhà thầu phá sản hoặc mất khả năng thanh toán, Chủ đầu tư có thể chấm dứt Hợp đồng vào bất kỳ thời điểm nào bằng cách gửi thông báo cho Nhà thầu. Trong trường hợp đó, Hợp đồng sẽ chấm dứt và Nhà thầu không được bồi thường với điều kiện là việc chấm dứt Hợp đồng không gây tổn hại hoặc ảnh hưởng đến bất kỳ quyền khởi kiện hoặc biện pháp khắc phục của Chủ đầu tư trước đó hoặc sau đó.

30. <u>Hạn chế xuất khẩu</u>

Trường hợp quốc gia, vùng lãnh thổ cung cấp hàng hóa, dịch vụ có các quy định thương mại dẫn tới việc hạn chế xuất khẩu, gây khó khăn cho Nhà thầu trong việc thực hiện các nghĩa vụ Hợp đồng, Nhà thầu không bắt buộc phải hoàn thành nghĩa vụ giao hàng, thực hiện dịch vụ với điều kiện là Nhà thầu cung cấp cho Chủ đầu tư các tài liệu chứng minh việc đã hoàn thành tất cả các thủ tục xuất khẩu cần thiết, bao gồm cả xin giấy phép hoặc ủy quyền để xuất khẩu hàng hóa, dịch vụ theo Hợp đồng. Trong trường hợp này, Chủ đầu tư có thể chấm dứt Hợp đồng với Nhà thầu.

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

****

HỢP ĐỒNG SỐ: .....

V/v: Cung cấp ....., Lô 04-3 (Gói thầu 91-VT-1614/26-XL-TTHN)

Căn cứ vào nhu cầu của Liên doanh Việt – Nga Vietsovpetro - Hợp đồng Dầu khí Lô 04-3 và khả năng cung cấp của Công ty...

Hôm nay, ngày _____ tháng____ năm 2026, các Bên gồm:

BÊN MUA: LIÊN DOANH VIỆT – NGA VIETSOVPETRO – HỢP ĐỒNG DẦU KHÍ LÔ 04-3 – Gọi tắt là Bên A

Địa chỉ : 105 Lê Lợi, Phường Vũng Tàu, Tp. Hồ Chí Minh
Điện thoại : 0254. 3839 871 / 3839 872
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Tài khoản số : 0081001135976
Tại Ngân hàng TMCP Ngoại thương Việt Nam, chi nhánh Vũng Tàu
Mã số thuế : 3501584785
Đại diện **Ông Trần Quốc Thắng – Phó Tổng giám đốc làm đại diện**
(Theo Giấy ủy quyền số 37/UQ-PL ngày 06/01/2026)

BÊN BÁN: CÔNG TY …… – Gọi tắt là Bên B

Địa chỉ :
Điện thoại :
Fax :
Tài khoản số :
:
Mã số thuế :
Đại diện

Hai Bên thỏa thuận ký kết hợp đồng với các điều khoản như sau:

<u>Điều 1:</u> Đối tượng hợp đồng

Bên A đồng ý mua và Bên B đồng ý bán **"……. – Lô 04-3"** (sau đây gọi tắt là "Hàng hóa") với chủng loại, số lượng, đặc điểm kỹ thuật, đơn giá, giá trị hàng hóa theo Phụ lục số 01 của hợp đồng và là một phần thống nhất và không tách rời của hợp đồng này.

Hàng hóa của hợp đồng được Vietsovpetro sử dụng cho hoạt động dầu khí tại Lô 04-3.

<u>Điều 2:</u> Giá trị hợp đồng

- ***Đối với các hàng hóa được sản xuất, gia công trong nước hoặc hàng hóa được sản xuất, gia công ở ngoài nước nhưng đã nhập khẩu vào Việt Nam:***

2.1 **Tổng giá trị Hợp đồng: _____ VNĐ**

Bằng chữ: _____

Trong đó: - Tiền hàng hóa: _____ VNĐ
- Tiền thuế GTGT: _____ VNĐ

2.2 Tiền thuế GTGT ghi ở Điều 2.1 là tiền thuế GTGT tạm tính. Thuế GTGT thực tế sẽ được thanh toán theo luật thuế hiện hành.

2.3 Giá trị hợp đồng nêu trên được tính trên cơ sở giao hàng tại kho Vietsovpetro tại Thành phố Hồ Chí Minh, bao gồm giá trị hàng hóa và các loại phí do Bên B chi trả như phí vận chuyển, đóng gói, bốc xếp lên phương tiện vận chuyển, giám định hàng hóa trước khi gửi hàng, … và các chi phí khác liên quan đến việc thực hiện Hợp đồng này. Giá trên là giá cố định và không thay đổi trong suốt thời gian Hợp đồng có hiệu lực.

- ***Đối với các hàng hóa được sản xuất, gia công ở ngoài nước và Bên B sử dụng quota của Bên A để nhập khẩu trực tiếp hàng hóa:***

2.4 Tổng giá trị Hợp đồng: _____ VNĐ

Bằng chữ: _____

Giá trị Hợp đồng nêu trên không bao gồm thuế nhập khẩu và chưa bao gồm thuế GTGT. Bên B sẽ sử dụng hạn mức nhập khẩu của Bên A cho Lô 04-3 để làm thủ tục nhập khẩu hàng hóa cho Hợp đồng này để được miễn thuế nhập khẩu. Thuế GTGT áp dụng theo Luật thuế GTGT hiện hành.

2.5 Giá trị Hợp đồng nêu trên được tính trên cơ sở giao hàng tại kho Vietsovpetro tại Thành phố Hồ Chí Minh, bao gồm giá trị hàng hóa và các loại phí do Bên B chi trả như phí vận chuyển, đóng gói, bốc xếp lên phương tiện vận chuyển, giám định hàng hóa trước khi gửi hàng, … và các chi phí khác liên quan đến việc thực hiện Hợp đồng này. Giá trên là giá cố định và không thay đổi trong suốt thời gian Hợp đồng có hiệu lực.

<u>Điều 3:</u> Quy cách, số lượng, chất lượng hàng hóa

3.1 Quy cách, số lượng, chất lượng, chủng loại, ký mã hiệu, hãng sản xuất, nước sản xuất, năm sản xuất và những thông số khác của hàng hóa do Bên B cung cấp phải phù hợp với quy định nêu trong Phụ lục số 01 của hợp đồng này. Hàng hóa mới 100%, chưa qua sử dụng và trong tình trạng sử dụng tốt, được sản xuất năm …….

3.2 Hồ sơ kèm theo hàng hóa gồm:

- Hóa đơn thuế GTGT (Bản gốc);
- Chứng chỉ xuất xứ (C/O) do phòng Thương mại hoặc cơ quan có thẩm quyền của nước sản xuất hoặc nước xuất khẩu hàng cấp (Bản gốc / Bản điện tử có kèm đường link để kiểm tra);
- Chứng chỉ số lượng và chất lượng (C/Q) do nhà sản xuất cấp (Bản gốc);
- Các chứng chỉ khác (theo các yêu cầu kỹ thuật của HSMT) (Bản gốc);
- Chứng chỉ bảo hành của Bên B bảo hành …… kể từ ngày giao hàng (Bản gốc);
- Tờ khai hải quan hàng hóa nhập khẩu (Bản copy);
- Tài liệu kỹ thuật của hàng hóa (nếu có).

Hồ sơ mời thầu của Bên A và Hồ sơ dự thầu của Bên B cho gói thầu số ……. là tài liệu tham chiếu về kỹ thuật cho hàng hóa của hợp đồng này.

<u>Điều 4</u>: Giao nhận và kiểm tra, giám định hàng hóa

4.1 Hàng hóa được giao phải phù hợp với yêu cầu quy định tại Điều 1 và Điều 3 của hợp đồng này trong thời hạn: Nhóm 1: không muộn hơn **120 ngày lịch và nhóm 2: không muộn hơn 84 ngày lịch tính từ ngày VSP gửi thư thông báo trúng thầu (.../.../2026**). Ngày giao hàng của hợp đồng này được ghi trong Biên bản giao nhận hàng do đại diện hai Bên ký như quy định tại mục 4.8 dưới đây.

Định kỳ 02 tuần/lần (trước ngày 15 và 30 hàng tháng), Bên B có trách nhiệm thông báo bằng văn bản cho Bên A cập nhật tình hình đặt hàng, tiến độ sản xuất và kế hoạch giao hàng của hợp đồng. Trong quá trình thực hiện hợp đồng, nếu Bên B gặp vướng mắc liên quan đến việc giao hàng thì Bên B cần khẩn trương thông báo cho Bên A bằng văn bản để hai bên phối hợp xem xét xử lý nhằm đảm bảo việc cung cấp hàng hóa cho Bên A theo đúng chất lượng

và tiến độ của hợp đồng.

4.2 *(Đối với trường hợp nhà thầu sử dụng quota của VSP để nhập khẩu hàng hóa)* Bên B tự chịu trách nhiệm làm thủ tục Hải quan cho hàng hóa nhập khẩu. Bên A cho phép Bên B được sử dụng hạn mức nhập khẩu của Bên A đã đăng ký tại Hải quan Vũng Tàu để làm thủ tục nhập khẩu và hỗ trợ Bên B về mặt giấy tờ trong việc sử dụng hạn mức nhập khẩu của Bên A cho lô hàng nhập khẩu của Hợp đồng này để Bên B xin miễn thuế nhập khẩu theo quy định cho Liên doanh Việt – Nga Vietsovpetro – Hợp đồng Dầu khí Lô 04-3.

4.3 *(Đối với trường hợp nhà thầu sử dụng quota của VSP để nhập khẩu hàng hóa)* Để thuận tiện cho việc thông quan, làm các thủ tục miễn thuế nhập khẩu, hàng hóa Bên B nên nhập về cảng Vũng Tàu. Bên A không chịu trách nhiệm trả tiền thuế cho Bên B trong trường hợp nếu Bên B nhập hàng hóa về cảng khác mà không làm được thủ tục miễn thuế hoặc Bên B không sử dụng hạn mức nhập khẩu của Bên A. Trong trường hợp Bên B đã sử dụng hạn mức nhập khẩu của Bên A nhưng không được miễn thuế thì Bên A sẽ thanh toán tiền thuế nhập khẩu căn cứ trên chứng từ thực tế nhưng không vượt quá giá trị thuế nhập khẩu mà Bên B đã chào trong HSDT.

4.4 Hàng hóa được giao tối đa **02 lần** vào kho của Bên A tại thành phố Hồ Chí Minh. Bên B cam kết giao hàng đúng số lần quy định.

4.5 Dỡ hàng từ phương tiện của Bên B tại kho của Bên A do Bên A đảm nhận bằng phương tiện, nhân lực và chi phí của mình.

4.6 Trong vòng 02 ngày trước khi giao hàng, Bên B phải thông báo bằng văn bản cho Bên A biết về số lượng, quy cách đóng gói hàng hóa để Bên A bố trí nhân lực và phương tiện bốc dỡ.

4.7 Người của Bên B đến giao hàng phải có giấy giới thiệu của người đại diện ký Hợp đồng của Bên B.

4.8 Đại diện của Liên doanh Việt – Nga Vietsovpetro (là Xí nghiệp Dịch vụ và Đơn vị đặt hàng) và đại diện của Bên B tham gia giao nhận, kiểm tra hàng hóa của hợp đồng này và lập Biên bản giao nhận hàng (theo Phụ lục số 02 của hợp đồng này) sẽ ghi rõ số lượng, tìnhtrạng, các hồ sơ giao kèm theo hàng hóa. Biên bản giao nhận hàng phải được Lãnh đạo Xí nghiệp Dịch vụ và Lãnh đạo Đơn vị đặt hàng phê duyệt. Biên bản giao nhận hàng là căn cứ để Bên A thanh toán cho Bên B.

4.9 Trong trường hợp cần thiết, bằng chi phí của mình, Bên A (giao cho Xí nghiệp Dịch vụ) có quyền trưng cầu cơ quan giám định độc lập tham gia giám định hàng hóa. Trong vòng 03 ngày làm việc kể từ khi kết thúc giám định, cơ quan giám định độc lập cung cấp Chứng thư giám định tình trạng và số lượng hàng hóa. Chứng thư giám định hàng hóa là căn cứ pháp lý để Bên A khiếu nại Bên B.

4.10 Bên B phải đảm bảo khi giao hàng hóa cho Bên A phải có kèm theo đầy đủ các chứng từ như quy định tại **Điều 3** của Hợp đồng này. Trong trường hợp Bên B giao hàng tới kho của Bên A tại Thành phố Hồ Chí Minh nhưng chưa có đầy đủ các chứng từ theo quy định thì Bên A đồng ý cho Bên B tạm gửi hàng tại kho để chờ tập hợp đầy đủ các chứng từ cho việc giao nhận hàng hóa chính thức.

Bên A đồng ý miễn phí lưu kho đối với lô Hàng tạm gửi này của Bên B trong 05 ngày lịch đầu tiên. Kể từ ngày thứ 6 trở đi, Bên B sẽ phải trả cho Bên A chi phí lưu kho của lô Hàng theo mức đơn giá lưu kho hiện hành của Bên A đang áp dụng cho các khách hàng của Bên A. Chi phí lưu kho này sẽ được Bên A khấu trừ thẳng vào giá trị mà Bên A thanh toán cho Bên B theo quy định của Hợp đồng này hoặc những khoản thanh toán ở những Hợp đồng khác đã ký giữa Hai Bên.

4.11 Bên A có quyền từ chối nhận Hàng nếu Hàng hóa khi giao không đảm bảo chất lượng, như đã quy định ở Điều 1, Phụ lục số 01 cũng như không có đầy đủ bộ chứng từ đi kèm như quy định tại Điều 3 của Hợp đồng này.

<u>Điều 5:</u> Bao bì, Đóng gói và Ký mã hiệu

5.1 Hàng hóa giao theo Hợp đồng này sẽ được đóng trong bao bì thích hợp theo tiêu chuẩn xuất khẩu, bảo đảm cho hàng hoá không bị hư hại, ăn mòn trong quá trình vận chuyển và thuận tiện cho bốc xếp, bốc dỡ.

5.2 Bên B hoàn toàn chịu trách nhiệm trong trường hợp hàng hoá bị mất mát, hư hỏng do thiếu sót trong việc đóng gói Hàng hoá.

5.3 Hàng hóa có thể được ghi rõ ràng bằng sơn không xóa được trên bề mặt hoặc in trên tấm ghi nhãn đính trên từng kiện với các thông tin sau bằng tiếng Anh hay tiếng Việt:

- Tên nhà sản xuất.
- Tên Hàng.
- Khối lượng (nếu có).
- Số Hợp đồng (nếu có).

5.4 Bên B chịu toàn bộ phí tổn đối với mọi mất mát/ hư hại của Hàng hoá trong qúa trình bốc xếp, bốc dỡ, vận chuyển do ghi ký mã hiệu không đúng, không đầy đủ cũng như chịu mọi chi phí vận chuyển, bảo quản, mất mát phát sinh thêm do Hàng hóa bị gửi nhầm địa chỉ do ghi ký mã hiệu sai.

<u>Điều 6:</u> Trách nhiệm do vi phạm hợp đồng

6.1. Nếu Bên B giao hàng bị chậm bất kỳ mục nào của nhóm thì Bên B phải chịu phạt 0,2%/ngày/giá trị của nhóm cho 10 ngày lịch chậm đầu tiên; phạt 0,3%/ngày/giá trị của nhóm cho những ngày lịch tiếp theo trên tổng số giá trị hàng giao chậm cho đến mức tổng số tiền phạt không quá 8% giá trị của nhóm

Nếu Bên B giao Hàng hoá quy định tại Phụ lục số 01 của hợp đồng này theo nhiều lần giao hàng thì thời gian giao nhận hàng của hợp đồng được tính là thời gian giao hàng theo lần giao cuối cùng. Hàng hoá của những lần giao trước chỉ được ghi nhận lưu kho tại kho của Bên A cho đến khi Bên B giao nhận đủ số hàng của cả hợp đồng.

6.2. Nếu Bên B không giao đủ số lượng, chủng loại hàng hóa (như quy định tại Phụ lục số 01 của hợp đồng này) thì:

- Bên B vi phạm nghĩa vụ giao hàng theo hợp đồng này và phải chịu phạt một khoản tiền bằng 08% giá trị của cả hợp đồng.
- Nếu Bên B không giao đủ số lượng, chủng loại hàng hóa theo hợp đồng (như quy định tại Phụ lục số 01 của hợp đồng này) thì:
- Bên A có quyền từ chối nhận hợp đồng đó. Bên B vi phạm nghĩa vụ giao hàng theo hợp đồng này và phải chịu phạt một khoản tiền bằng 08% giá trị của cả hợp đồng.

6.3. Nếu Bên B giao hàng hoá vượt số lần giao nhận như quy định tại Điều 4 của hợp đồng này thì:

- Bên B đã vi phạm điều kiện giao nhận hàng và phải chịu trách nhiệm thanh toán các chi phí liên quan tới giao nhận hàng hoá cho lần giao hàng vượt quá số lần giao hàng theo hợp đồng này theo mức đơn giá hiện hành của Bên A đang áp dụng cho các khách hàng của Bên A.

6.4. Nếu Bên B giao hàng không đảm bảo chất lượng như qui định tại Điều 2 của hợp đồng thì Bên A sẽ không nhận hàng và phạt Bên B theo mức phạt không giao đủ hàng như quy định tại mục 6.2 của hợp đồng này. Bên A có quyền chấp nhận/không chấp nhận việc Bên B sẽ cung cấp hàng mới thay thế cho hàng không đảm bảo chất lượng trên.

6.5 Vi phạm do cung cấp chậm/cung cấp không đủ hàng hoá:

6.5.1. Nếu Bên B giao hàng chậm quá 60 ngày lịch so với thời gian quy định tại mục 4.1 của hợp đồng này, ngoại trừ trường hợp bất khả kháng, thì Bên A có quyền:

a) Chỉ định bên thứ 3 có khả năng cung cấp hàng hóa/hàng hoá kèm dịch vụ. Trong trường hợp đó Bên B có trách nhiệm ký hợp đồng với bên được chỉ định để tiếp tục thực hiện công việc cung cấp cho bên A.

Hoặc;

b) Trực tiếp ký hợp đồng mua hàng/hàng hoá kèm dịch vụ của Bên thứ 3 để tiếp tục thực hiện công việc của hợp đồng. Trong trường hợp đó Bên B phải trả khoản tiền chênh lệch và các chi phí liên quan nếu có.

Hoặc;

c) Đơn phương chấm dứt thực hiện hợp đồng và trong trường hợp này Bên B phải chịu phạt một khoản tiền bằng 08% giá trị của hợp đồng.

6.5.2. Nếu Bên B giao hàng chậm (một phần hàng hoá) quá 60 ngày lịch so với thời gian quy định tại mục 4.1 của hợp đồng này, ngoại trừ trường hợp bất khả kháng, thì Bên A có quyền:

a) Chỉ định bên thứ 3 có khả năng cung cấp hàng hóa/hàng hoá kèm dịch vụ. Trong trường hợp đó Bên B có trách nhiệm ký hợp đồng với bên được chỉ định để tiếp tục thực hiện công việc cung cấp cho bên A.

Hoặc;

b) Trực tiếp ký hợp đồng mua hàng/hàng hoá kèm dịch vụ của Bên thứ 3 để tiếp tục thực hiện công việc của hợp đồng. Trong trường hợp đó Bên B phải trả khoản tiền chênh lệch và các chi phí liên quan nếu có.

c) Đơn phương chấm dứt thực hiện tiếp hợp đồng và trong trường hợp này Bên B phải chịu phạt một khoản tiền bằng 08% giá trị của phần hợp đồng.

6.6 Tổng các loại phạt không vượt quá 08% giá trị hợp đồng.

6.7 Giá trị hợp đồng bị vi phạm ghi ở Điều 6 của hợp đồng này là giá trị không có thuế GTGT và không bao gồm thuế nhập khẩu.

6.8 Do hàng hóa của hợp đồng này được lựa chọn trọn gói, nên trong trường hợp Bên B không giao bất kỳ một mục hàng hóa nào của hợp đồng thì:

- Bên A có quyền từ chối nhận các mục còn lại của hợp đồng đó và Bên B chịu phạt mức tối đa 08% giá trị hàng hóa của cả hợp đồng; hoặc:
- Bên A có thể vẫn nhận các mục hàng hóa còn lại của hợp đồng nhưng khi đó Bên B sẽ chịu phạt với mức phạt tối đa 08% giá trị hàng hóa của cả hợp đồng đó.

6.9 Nếu Bên B giao hàng chậm bất kỳ một mục hàng hóa nào của hợp đồng thì Bên A có quyền áp dụng mức phạt giao hàng chậm tương ứng đối với giá trị hàng hóa của cả hợp đồng.

6.10 Để thu hồi khoản tiền phạt vi phạm, Bên A sẽ toàn quyền: 1) khấu trừ khoản tiền phạt vi phạm từ các khoản tiền mà Bên A sẽ thanh toán cho Bên B tại Hợp đồng này hoặc theo các hợp đồng khác được ký kết giữa hai bên; 2) Yêu cầu Ngân hàng cấp Bảo đảm thực hiện hợp đồng thanh toán ngay khoản tiền Bên B mở bảo lãnh cho Bên A; 3) Bằng văn bản, yêu cầu Bên B thanh toán. Trong mọi trường hợp, Bên B cam kết nghiêm túc thực hiện nghĩa vụ thanh toán của mình cho Bên A.

6.11. Việc bồi thường thiệt hại (nếu có) được thực hiện theo quy định của pháp luật Việt Nam

<u>Điều 7:</u> Bảo hành

7.1 Bên B chịu trách nhiệm bảo hành chất lượng của hàng hóa trong thời hạn 18 tháng kể từ ngày ký biên bản nghiệm thu hoặc 12 tháng kể từ ngày đưa hàng hóa vào sử dụng, tùy trường hợp nào đến trước. Điều kiện bảo hành theo đúng tiêu chuẩn bảo hành của nhà sản xuất.

7.2 Trong thời gian bảo hành nếu Bên A phát hiện có hư hỏng, sai sót về chất lượng hàng hóathì Bên A sẽ thông báo kịp thời bằng fax/email cho Bên B biết để cùng nhau xác minh. Việc xác minh sai sót về chất lượng phải được Bên B tiến hành không chậm quá 15 ngày lịch kể từ ngày Bên B nhận được thông báo. Việc xác minh phải được lập thành biên bản,trong đó

ghi rõ kết luận về nguyên nhân gây ra hư hỏng, xác định trách nhiệm thay thế cái mới/sửa chữa các hư hỏng đó thuộc về bên nào và thời hạn thay thế/sửa chữa làm căn cứ pháp lý trong thực hiện hợp đồng này.

7.3 Tùy mức độ hư hỏng, nhưng không quá 15 ngày lịch kể từ ngày có kết luận về nguyên nhân hư hỏng, sai sót về chất lượng hàng hóa do lỗi của Bên B thì Bên B phải tiến hành sửa chữa các sai sót về chất lượng hoặc đổi lại hàng mới cho Bên A.

7.4 Trong thời hạn 07 ngày lịch kể từ ngày nhận được thông báo của Bên A, nếu Bên B không trả lời thì coi như đã chấp nhận có sai sót về chất lượng hàng do lỗi của mình và có tráchnhiệm phải sửa chữa các sai sót đó hoặc đổi lại hàng mới ngay trong vòng 15 ngày kể từngày nhận được thông báo của Bên A.

7.5 Nếu Bên B tiến hành sửa chữa hoặc đổi lại hàng mới bị chậm so với thời hạn qui định ởmục 7.3 và 7.4 của hợp đồng này thì Bên B phải chịu phạt theo mức phạt giao hàng chậmnhư qui định ở mục 6.1 của hợp đồng này.

7.6 Trong thời hạn quy định trên tại điều 7 của hợp đồng này, nếu Bên B không tiến hành khắc phục (sửa chữa các sai sót về chất lượng do lỗi của mình hoặc đổi lại hàng mới) thìBên A có quyền tiến hành khắc phục (sửa chữa và/hoặc thay mới) và Bên B phải hoàn trảlại cho Bên A toàn bộ chi phí khắc phục, đồng thời phải chịu phạt 08% giá trị của mặt hàngnày. Cách thức Bên A thu hồi tiền phạt từ Bên B quy định tại điều 6.7 của hợp đồng này.

7.7 Hàng hóa sau khi được Bên B sửa chữa và thay thế trong thời kỳ bảo hành sẽ được Bên Bbảo hành lại 12 tháng kể từ ngày bàn giao (có Biên bản giao nhận hàng như quy định tại Phụ lục số 02 của hợp đồng này).

<u>Điều 8:</u> Thanh toán

8.1 Bên A thanh toán cho Bên B 100% giá trị hóa đơn hàng đã giao bằng phương thức chuyển khoản qua ngân hàng trong vòng 30 ngày làm việc kể từ ngày nhận được bộ chứng từ thanh toán gồm:

- 01 bản gốc Hóa đơn thuế GTGT.
- 01 bản gốc Biên bản giao nhận hàng (Điều 4.8 của Hợp đồng này).
- Chứng thư giám định (nếu có trưng cầu quy định tại Điều 4.9 của Hợp đồng này).
- Các chứng từ (theo quy định tại Điều 3.2 của Hợp đồng này).
- Bảo đảm thực hiện Hợp đồng (01 bản copy).
- Tờ khai Hải quan hàng nhập khẩu (01 bản copy).

8.2 Bên A chỉ thanh toán cho Bên B đối với hàng hóa hoàn toàn phù hợp với yêu cầu nêu trong hợp đồng.

8.3 Số tài khoản giao dịch theo hợp đồng này của Bên B:

- Số tài khoản: ……
- Tên Ngân hàng ……
- Người thụ hưởng: ……

8.4 Phí chuyển tiền do Bên A chịu.

<u>Điều 9:</u> Bảo đảm thực hiện Hợp đồng

9.1 Trong vòng 07 ngày làm việc sau ngày ký hợp đồng (ghi tại trang 01 của hợp đồng), Bên B phải nộp giấy bảo lãnh thực hiện hợp đồng (Phụ lục số 03 của hợp đồng này) được cấp bởi Ngân hàng có uy tín. Giá trị Bảo đảm thực hiện hợp đồng bằng 08% tổng giá trị hợp đồng. Giấy bảo lãnh này có hiệu lực bằng thời hạn giao hàng quy định tại mục 4.1 hợp đồng này cộng thêm 60 ngày lịch.

9.2 Mọi chi phí liên quan đến việc phát hành giấy bảo lãnh thực hiện hợp đồng do Bên B chịu.

9.3 Trong thời gian quy định tại mục 9.1 nêu trên, Bên B phải nộp bản gốc bảo lãnh thực hiện hợp đồng cho Bên A. Nếu sau thời gian quy định nói trên, Bên A không nhận được bảo lãnh thực hiện Hợp đồng thì Bên A có quyền đơn phương chấm dứt Hợp đồng và không hoàn trả

Bảo đảm dự thầu của Bên B hoặc áp dụng quy định tại mục 6.8 của Hợp đồng này.

9.4 Bên B không được nhận lại Bảo đảm thực hiện hợp đồng trong trường hợp Bên B từ chối/không thực hiện hợp đồng sau khi ký hợp đồng.

9.5 Trong trường hợp Bên B vi phạm trách nhiệm thực hiện hợp đồng theo quy định tại hợp đồng này thì khoản tiền bảo đảm được Bên A dùng để khấu trừ tiền phạt.

9.6 Bên B phải ngay lập tức yêu cầu Ngân hàng phát hành Bảo đảm thực hiện Hợp đồng thực hiện việc sửa đổi Bảo đảm thực hiện Hợp đồng trong trường hợp cần gia hạn thời gian hiệu lực của Bảo đảm này vì lý do chậm thực hiện hoặc gia hạn thời gian thực hiện, đồng thời gửi cho Bên A bản gốc Bảo đảm thực hiện Hợp đồng đã được gia hạn hiệu lực chậm nhất là 07 ngày làm việc trước khi Bảo đảm thực hiện Hợp đồng cũ hết hiệu lực.

Trường hợp Bên B chậm gia hạn hiệu lực bảo lãnh khi có yêu cầu của Bên A bằng văn bản thì Bên B sẽ chịu phạt 0,2% giá trị bảo lãnh tương ứng/mỗi ngày chậm. Tổng giá trị phạt này không vượt quá 08% giá trị bảo lãnh tương ứng.

Điều 10: Bất khả kháng

10.1 Sự kiện bất khả kháng là sự kiện xảy ra một cách khách quan không thể lường trước được và không thể khắc phục được mặc dù đã áp dụng mọi biện pháp cần thiết và khả năng cho phép như: chiến tranh, bạo loạn, xung đột vũ trang, cấm vận, thiên tai (lũ lụt, bão, lốc xoáy, động đất, sóng thần), hỏa hoạn, dịch bệnh (Epidemic, Pandemic) được WHO/Quốc gia công bố, lệnh phong tỏa Vùng/Quốc gia do Chính quyền sở tại áp đặt, ...

10.2 Bên gặp sự kiện bất khả kháng dẫn đến việc không thực hiện được nghĩa vụ theo hợp đồng do ảnh hưởng trực tiếp bởi các sự kiện bất khả kháng có nghĩa vụ phải ngay lập tức thông báo cho bên kia biết, bao gồm cung cấp thông tin, giải trình về sự ảnh hưởng trực tiếp của sự kiện bất khả kháng đến việc vi phạm thực hiện hợp đồng kèm chứng cứ chứng minh, các biện pháp đã được thực hiện để khắc phục vấn đề và giảm thiểu tổn thất. Việc chậm thông báo, cung cấp thông tin và giải trình nếu trễ hơn 14 ngày lịch sau khi sự kiện bất khả kháng xảy ra sẽ làm cho bên gặp bất khả kháng mất quyền miễn trách sau này vì lý do bất khả kháng.

10.3 Văn bản xác nhận của Phòng Thương mại và Công nghiệp Việt Nam hoặc cơ quan có thẩm quyền ở nơi xảy ra sự kiện bất khả kháng là bằng chứng đủ để chứng minh sự kiện và thời gian xảy ra bất khả kháng.

10.4 Nếu sự kiện bất khả kháng kéo dài hơn 02 tháng, mỗi bên đều có quyền chấm dứt hợp đồng này mà không phải bồi thường bất cứ một khoản tiền nào cho bên kia.

10.5 Các khó khăn trong sản xuất như thiếu vật tư, điện, nhân công, đình công… không được coi là bất khả kháng và không miễn cho Bên B nghĩa vụ giao hàng hoặc giao hàng muộn; Các thông tin từ trang báo, mạng và các phương tiện truyền thông khác chỉ mang tính chất tham khảo.

Điều 11: Giải quyết tranh chấp

11.1 Bất kỳ tranh chấp nào phát sinh từ hợp đồng này sẽ được giải quyết bằng thương lượng giữa hai bên trên tinh thần hợp tác, hai bên cùng có lợi và tôn trọng lẫn nhau.

11.2 Trường hợp tranh chấp không thể giải quyết bằng thương lượng thì sẽ được giải quyết bằng trọng tài tại Trung tâm Trọng tài Quốc tế Việt Nam (VIAC) tại Hà Nội theo Quy tắc tố tụng trọng tài của Trung tâm này.

Số lượng trọng tài viên là 03 người.

Luật áp dụng là Luật Việt Nam.

Phán quyết của Trung tâm trọng tài là cuối cùng và buộc hai Bên phải tuân thủ.

Trọng tài phí do Bên thua kiện chịu.

Điều 12: Các điều khoản khác

12.1 Bất kỳ sự sửa đổi, bổ sung nào đối với Hợp đồng này đều phải được lập thành văn bản và có

chữ ký của cả hai bên. Mọi giao dịch trong quá trình thực hiện Hợp đồng được các Bên thực hiện bằng văn bản và gửi theo đường bưu chính hoặc theo số Fax tới địa chỉ đăng ký hoặc số Fax của mỗi Bên ghi trong hợp đồng và email đến địa chỉ email … theo mẫu thể hiện tại Phụ lục số 04 (A, B) kèm theo.

12.2 Những điều không quy định hoặc quy định không đầy đủ trong Hợp đồng này sẽ căn cứ vào luật pháp Việt Nam hiện hành.

12.3 Không Bên nào được chuyển quyền và nghĩa vụ của mình theo hợp đồng này cho Bên thứ ba mà không được sự đồng ý trước bằng văn bản của Bên kia.

12.4 Trong quá trình thực hiện hợp đồng trường hợp xảy ra tranh chấp thì các văn bản dẫn chiếu được xem xét theo thứ tự ưu tiên xử lý theo mục Mục 2.2 ĐKC.

12.5 Hợp đồng này có hiệu lực kể từ ngày Ngân hàng Bên B mở bảo lãnh thực hiện Hợp đồng (ngày hiệu lực của bảo lãnh) và hoàn thành việc ký Hợp đồng nhưng không muộn hơn 7 ngày làm việc so với ngày được ghi trên Hợp đồng và tiếp tục cho đến khi hai Bên thực hiện hết trách nhiệm của mình như quy định trong hợp đồng.

12.6 Hết thời hạn hiệu lực của hợp đồng, nếu hai bên không có khiếu nại gì coi như hợp đồng đã được thanh lý.

12.7 Hợp đồng gồm …… trang và 04 Phụ lục (Phụ lục số 01: Phạm vi cung cấp và bảng giá trị, Phụ lục số 02: Biên bản giao nhận hàng, Phụ lục số 03: Bảo lãnh thực hiện Hợp đồng và Phụ lục số 04 (A, B): Mẫu Phương thức giao dịch) được lập thành 05 bản bằng tiếng Việt (có sử dụng tiếng Anh mô tả hàng hóa tại Phụ lục số 01), các bản có giá trị pháp lý như nhau, Bên A giữ 04 bản, Bên B giữ 01 bản.

ĐẠI DIỆN BÊN A **ĐẠI DIỆN BÊN B**

PHỤ LỤC SỐ 01
HỢP ĐỒNG SỐ .....

PHẠM VI CUNG CẤP VÀ GIÁ TRỊ HÀNG HÓA

Mua ..... (Lô 04-3)

Số TT	Tên hàng, Ký hiệu, Quy cách	Mô tả	Model, P/N	Nhà sản xuất	Xuất xứ (CO)	ĐVT	Số lượng cung cấp	Đơn giá (VND)	Thành tiền (VND)
I		**Hàng hóa sử dụng hạn ngạch để nhập khẩu, hàng hóa sử dụng Quota Lô 04-3**							
1	……							……	……
2	……							……	……
…	……							……	……
n	……							……	……
		Giá trị Hàng hóa							**……**
		Thuế nhập khẩu							**……**
		Thuế GTGT							**……**
	Thành tiền I	***Giá trị Hàng hóa đã bao gồm thuế nhập khẩu và thuế GTGT***							**……**
II		**Hàng hóa không sử dụng hạn ngạch để nhập khẩu (*Hàng hóa mua trong nước hoặc hàng hóa được sản xuất tại Việt Nam)***							
1	……							……	……
2	……							……	……
…	……							……	……
n	……							……	……
		Giá trị Hàng hóa chưa bao gồm thuế GTGT							**……**
		Thuế GTGT (áp dụng theo Quy định hiện hành của Việt Nam)							**……**
	Thành tiền II	***Giá trị Hàng hóa đã bao gồm thuế GTGT và bao gồm toàn bộ các thuế, phí và chi phí phát sinh trong lãnh thổ Việt Nam***							**……**
		Tổng giá trị hợp đồng *(mục I+II)*							**……**

ĐẠI DIỆN BÊN A **ĐẠI DIỆN BÊN B**

PHỤ LỤC SỐ 02
HỢP ĐỒNG SỐ .....

Phê duyệt - Утверждаю	Phê duyệt - Утверждаю
Thủ trưởng đơn vị đặt hàng	Giám đốc XNDV Cảng &Cung ứng vật tư
TB Директор пред–я заказчика	Директор ПОСОМ
Ngày…….tháng…….năm 20….	*Ngày…….tháng…….năm 20….*

BIÊN BẢN GIAO NHẬN HÀNG
АКТ О ПРИЁМЕ - ПЕРЕДАЧЕ ТОВАРОВ

Ngày.… tháng…. năm 20….
Căn cứ HĐ (biên bản) số: ký ngày…. tháng….năm 20…
На основнии Договора номер:
Chúng tôi, những người ký tên dưới đây - Мы. Нижеподписавщиеся:

1- Đại diện bên giao - Представители поставщика:
- Ông (Bà) Chứcvụ:
- Ông (Bà): Chứcvụ:

2- Đại diện bên nhận - Представители получателя:

2.1 XN dịch vụ cảng & cung ứng vật tư TB - ПОСОМ
- Ông (Bà): Chứcvụ:
- Ông (Bà): Chứcvụ:

2.2 Đơn vị đặt hàng - Представители предприятия - заказчика:
- Ông (Bà): Chứcvụ:
- Ông (Bà): Chứcvụ:
- Ông (Bà): Chứcvụ:
- Ông (Bà): Chứcvụ:

Cùng nhau tiến hành giao nhận hàng hóa, cụ thể như sau: - Произвели приёмо - передачу следующих товаров на складе:...

STT П/П	Tên hàng, Ký hiệu, Quy cách Наименование, марка товаров	ĐVT ЕД	Thực nhập Фак. Получение		Bao bì Тара	Chất lượng hàng Качество
			Số lượng Кол.	Trọng lượng Вес.		

- Mẫu phân tích các mặt hàng No. …… được lấy tại …… - Образец товара получен на складе: …… ngày …… tháng …… năm 20…

- Người lấy mẫu - Приемщик: …… Chức vụ - Должность:

- Người lấy mẫu - Приемщик: …… Chức vụ - Должность:

Đối với những mặt hàng lấy mẫu phân tích nêu trên thì hàng chỉ chuyển chủ từ Bên giao sang Bên nhận. Sau khi có kết quả phân tích mẫu đạt yêu cầu như mẫu chào hàng. Trong thời gian chờ kết quả phân tích mẫu, Bên nhận (XNDV hoặc đơn vị đặt hàng) nhận giữ hộ.

CHỨNG TỪ KÈM THEO - Прилагаемые документы:

- Chứng chỉ phẩm chất - Сертификат:……
- Hóa đơn (phiếu xuất kho) - Счёт: ……
- Bản kê chi tiết danh điểm mặt hàng (Перечень товаров) gồm __bản __tờ
- Các chứng từ khác - Другие документы : ……

……
……

Biên bản này chỉ lập một bản và chỉ có giá trị để làm thủ tục thanh toán sau khi được Giám đốc XNDVCảng & Cung ứng vật tư TB và lãnh đạo đơn vị đặt hàng phê duyệt (trường hợp giao nhận thẳng cho đơn vị đặt hàng thì biên bản này phải được thủ trưởng đơn vị đặt hàng phê duyệt trước).

Ngày giao hàng của lô hàng này là …

ĐẠI DIỆN BÊN GIAO **KÝ TÊN** - Подписи **ĐẠI DIỆN BÊN NHẬN**

Представители поставщика: Представители получателя:

(Họ tên và chữ ký) (Họ tên và chữ ký)

Xác nhận chất lượng của phòng thí nghiệm hoặc đơn vị đặt hàng (nếu có) - Справка лаборатории (заказчика) по качеству

……
……

Đại diện phòng thí nghiệm (Hoặc đơn vị đặt hàng) - Представитель лаборатории (заказчика)

Họ và tên - Фамилия ..... Ký tên: Подпись

Ngày……tháng……năm 20….

Kiểm tra và xác nhận: Các mặt hàng nêu trên có số lượng, ký mã hiệu, xuất xứ hàng hóa, chứng chỉ chất lượng & được kiểm tra chất lượng v.v. phù hợp với các quy định của hợp đồng (Biên bản) Заключение:

Состояние товаров. Количество марки. Место происхождения. Сертификат по качеству и проверка качества....выщеуказнных товаров соответствуют условиям Договора:

T.P vật tư thiết bị - Начальник курирующего отделаю

Ký tên: Подпись *Ngày……tháng……năm 20….*

Trưởng phòng THHĐ - Начальник ОКД

Ký tên: Подпись *Ngày……tháng……năm 20….*

PHỤ LỤC SỐ 03
HỢP ĐỒNG SỐ .....
MẪU BẢO LÃNH THỰC HIỆN HỢP ĐỒNG

Ngày tháng năm

TO: _____ *[name of the Employer]*
(Hereinafter referred to as the "Employer")

Liên quan tới Hợp đồng _____ về việc _____ (sau đây được gọi là "Hợp đồng") được ký giữa _____ (sau đây gọi là "BÊN ĐƯỢC BẢO LÃNH") và _____ (sau đây gọi là "BÊN THỤ HƯỞNG"), chúng tôi, _____ có trụ sở chính tại ____ (sau đây gọi là "BÊN BẢO LÃNH") phát hành Thư bảo lãnh không hủy ngang và vô điều kiện cho bên thụ hưởng với số tiền là _____ (Bằng chữ: _____) (sau đây gọi là "THƯ BẢO LÃNH").

THƯ BẢO LÃNH này có hiệu lực kể từ ngày phát hành và sẽ duy trì hiệu lực cho đến _____ sau đây gọi là "Ngày hết hiệu lực". Đối với bất cứ sự gia hạn, đổi mới hoặc chuyển nhượng Hợp đồng vượt quá thời gian được quy định trong THƯ BẢO LÃNH này, BÊN THỤ HƯỞNG sẽ không cần phải thông báo hoặc được sự đồng thuận của BÊN BẢO LÃNH. THƯ BẢO LÃNH này sẽ được gia hạn dựa trên yêu cầu bằng văn bản từ BÊN ĐƯỢC BẢO LÃNH để đảm bảo cho thời gian gia hạn, đổi mới hoặc chuyển nhượng của Hợp đồng.

BÊN BẢO LÃNH cam kết **không hủy ngang và vô điều kiện** thanh toán ngay cho BÊN THỤ HƯỞNG một khoản tiền hay những khoản tiền, theo chỉ thị của BÊN THỤ HƯỞNG, tổng không vượt quá số tiền bảo lãnh nêu trên trong vòng 05 ngày làm việc kể từ ngày nhận được văn bản yêu cầu của BÊN THỤ HƯỞNG ghi rõ BÊN ĐƯỢC BẢO LÃNH đã vi phạm nghĩa vụ theo Hợp đồng.

Sau Ngày hết hiệu lực, THƯ BẢO LÃNH này sẽ tự động không còn giá trị cho dù bản gốc THƯ BẢO LÃNH và các Thư sửa đổi liên quan (nếu có) có được gửi trả lại BÊN BẢO LÃNH hay không.

Số tiền bảo lãnh nêu trên sẽ được thanh toán ngay bởi BÊN BẢO LÃNH cho BÊN THỤ HƯỞNG cho dù có sự tranh cãi hoặc phản đối nào của BÊN ĐƯỢC BẢO LÃNH hoặc của BÊN BẢO LÃNH hoặc của bất kì bên thứ ba nào khác, và bất kể có hay không sự tranh chấp giữa BÊN ĐƯỢC BẢO LÃNH và BÊN THỤ HƯỞNG về hoặc liên quan tới Hợp đồng hoặc về bất cứ vấn đề khác và cho dù những tranh chấp này, nếu có, đã được giải quyết, dàn xếp, kiện tụng hoặc phân xử bằng bất kỳ hình thức nào.

BÊN BẢO LÃNH hoặc BÊN ĐƯỢC BẢO LÃNH sẽ không được giải trừ bất cứ nghĩa vụ nào theo THƯ BẢO LÃNH này cho dù có bất cứ sự sửa đổi, thay đổi, thanh toán sai lệch, gia hạn nào liên quan tới Hợp đồng hay bất kỳ sự trì hoãn ân hạn nào của BÊN THỤ HƯỞNG trong hoặc liên quan đến bất cứ vấn đề gì của Hợp đồng.

Việc đòi tiền nhiều lần theo bảo lãnh này là được phép và theo đó, Số tiền bảo lãnh nêu trên sẽ tự động giảm tương ứng với số tiền mà Ngân hàng đã thực hiện thanh toán cho Bên thụ hưởng theo Thư bảo lãnh.

Thư bảo lãnh được điều chỉnh và giải thích theo pháp luật Việt Nam. Bất kỳ tranh chấp nào phát sinh từ hoặc liên quan đến Thư bảo lãnh sẽ [do Tòa án nhân dân có thẩm quyền của Việt Nam giải quyết theo quy định của pháp luật] / [sẽ được giải quyết tại Trung tâm Trọng tài quốc tế Việt Nam (VIAC) bên cạnh Phòng Thương mại và Công nghiệp Việt Nam theo quy tắc tố tụng trọng tài của VIAC].

THƯ BẢO LÃNH này được phát hành duy nhất 01 (một) bản bằng tiếng Việt và không được phép chuyển nhượng.

NGÂN HÀNG BẢO LÃNH
[Ký tên và đóng dấu]

PHỤ LỤC SỐ 04 (A)
HỢP ĐỒNG SỐ .....
MẪU THƯ TÍN GIAO DỊCH THỰC HIỆN HỢP ĐỒNG

Ngày tháng năm 20..

Kính gửi: **Liên doanh Việt – Nga Vietsovpetro / Nhà thầu**
(ghi địa chỉ số Fax của Bên giao dịch)

Người nhận: *Họ và tên + Chức danh của Lãnh đạo VSP ký hợp đồng*
Sao gửi: Lãnh đạo phòng Thương mại VSP

Email: vspadmin@vietsov.com.vn
(Đồng thời gửi e-mail đến địa chỉ của Người thực hiện / Người phụ trách – sẽ ghi chi tiết khi ký kết hợp đồng)

(Ghi nội dung giao dịch về: Thay đổi về Hàng hóa / Dịch vụ, tiến độ, sử dụng Quota, các nội dung liên quan tới giá trị Hợp đồng, thanh toán, ……**)**.

ĐẠI DIỆN BÊN …
(Ký tên và đóng dấu)

PHỤ LỤC SỐ 04 (B)
HỢP ĐỒNG SỐ .....
MẪU THƯ TÍN GIAO DỊCH THỰC HIỆN HỢP ĐỒNG

Ngày tháng năm 20..

Kính gửi: **Liên doanh Việt – Nga Vietsovpetro / Nhà thầu**
(ghi địa chỉ số Fax của Bên giao dịch)

Người nhận: *Phòng Thương mại VSP / XN Dịch vụ Cảng và CƯVTTB / Đơn vị đặt hàng*

Email: vspadmin@vietsov.com.vn
(Đồng thời gửi e-mail đến địa chỉ của Người thực hiện / Người phụ trách – sẽ ghi chi tiết khi ký kết hợp đồng)

(Ghi nội dung giao dịch về: Thông báo giao hàng, gửi chứng từ hàng hóa, thông báo bắt đầu thực hiện Dịch vụ, thông tin về nhân sự / thiết bị thực hiện Dịch vụ, ……).

ĐẠI DIỆN BÊN …
(Ký tên và đóng dấu)

Part 4. APPENDICES

This Chapter includes:

1 - Attachment 01: SCOPE OF SUPPLY

2 - Attachment 02: TECHNICAL REQUIREMENT

3 - Attachment 03: TECHNICAL EVALUATION CRITERIA

And other Technical documents, … with link for reference (if any).

DANH MỤC- СПЕЦИФИКАЦИЯ

Tên hàng hóa/Dịch vụ - На приобретение товаров/услуг: Valves; Piping; Fitting & Structure materials để lắp đặt van điều áp/ Клапаны; Трубопроводы; Фитинги и конструкционные материалы (Установка клапана регулирования давления (PVC)

Số ĐHXN - № заявки: 91.XNXL-0214/26-TVT

STT П/п	Mã Vật Tư Код МТР	Tên VTTB/dịch vụ (Việt/Nga hoặc Anh) Наименование МТР/услуг (вьетнам./русс. или англ.)	Đặc Tính Kỹ Thuật Технические характеристики	ĐVT Ед. Изм.	Số Lượng Кол-во	Ghi Chú Примечание
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
I. VẬT TƯ THIẾT BỊ						
Group 1: Valves						
1	040.001.08341	BALL VALVE 3/4" ANSI CLASS 800 OR 3000 PSIG SOCKET WELD X NPTF ENDS - КРАН ШАРОВОЙ 3/4" ANSI CLASS 800 - Van bi	3/4 in Ball Valve Full Bore, 3000 Psig / 800#, Pupped PE end x FNPT end, Body ASTM A105N, ASME B16.34, Floating Ball Type, Lever Operated, Locking device, Pup piece ASTM A106 Gr.B, Sch160	Pce	5,00	
2	040.001.11086	10" Ball Valve Reduced Bore, Flanged ends, 300#,RF, ASTM A216WCB, API 6D), Trunnion mounted, Gear Operated, EX bonnet (100mm)		Pce	4,00	
3	040.001.03772	PRESSURE CONTROL VALVE 8"-300# - Van điều khiển/ Клапан регулятора расхода		Set	2,00	
Group 2: Piping, fitting, flange and structure materials						
4	040.015.00841	10 in x 8 in Eccentric Reducer, BW, S-40 x S-40, ASTM A234-WPB, ASME B16.9 Class AC4 - Переходник Эксцентрический/ Eccentric Reducer	10 in x 8 in Eccentric Reducer, BW, S-40 x S-40, ASTM A234-WPB, ASME B16.9 Class AC4	Pce	4,00	
5	040.004.03803	Concentric Reducer 3"x2", BW, S-40 x S-40, ASTM A234-WPB, ASME B16.9 -	Concentric Reducer 3"x2", BW, S-40 x S-40, ASTM A234-WPB, ASME B16.9	Pce	1,00	

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		Đầu nối chuyển tiếp/ Концентрический переход				
6	040.005.03628	Elbow 10", 45Deg, BW, S-40, ASTM A234-WPB, Seamless, ASME B16.9 - Đầu nối cong/ Отвод	Elbow, Degree: 45 Deg, Standard Specification: ASTM A234, Material Grade: WPB, Dimensional Standard: ASME B16.9, Bend Radius: Long, Method of Manufacture: Seamless, End Preparation: Buttweld, Schedule Pressure Class: Sch 40, Nominal Pipe Size: 10 inch	Pce	1,00	
7	040.010.01518	Equal Tee 10"" Sch40 BW ASTM A234 WPB - Đầu nối chạc ba/ Тройник	Type: Equal Tee, Material specification: ASTM A234, Material grade: WPB, Dimensional standard: ASME B16.9, End preparation: Buttweld, Method of Manufacture: Seamless Schedule pressure class: Sch 40, Nominal Pipe size: 10inch	Pce	1,00	
8	040.002.00316*	Nippoflange 150mm Long, 10" x 3/4" - 300# RF, Sch160,ASTM A105N, ASME B16.5 - Mặt bích/ Фланец		Pce	2,00	
9	040.011.01413	Plug, 3/4 in, NPTM, 3000#, ASTM A105N, ASME B16.11 - Nắp bịt ren / ЗАГЛУШКА - Пробка	Type: Hexagon Plug, Material specification: ASTM A105N, Dimensional standard: ASME B16.11, End preparation: NPTM, Schedule pressure class: 3000#, Dimension: 3/4 inch	Pce	6,00	
10	040.011.01502	Plug 1/2"; NPTM; 3000#; ASTM A182-F316; ASME B16.11 - Nút bịt/ Пробка	Plug, NPTM, 1/2", 3000#, ASTM A182-F316, ASME B16.11	Pce	2,00	
11	040.010.01656	Sockolet 10"x3/4"; 6000#; ASTM A105N; MSS SP-97		Pce	6,00	
12	040.002.05803	Flange WN, 2", 150#, RF, S-40S, ASTM A182-F316, ASME B16.5 - Mặt bích/ Фланец	Flange WN, 2", 150#, RF, S-40S, ASTM A182-F316, ASME B16.5	Pce	1,00	
13	040.002.06319	Flange WN, 10"-300#, RF, S-40, ASTM A105N, ASME B16.5 - Mặt bích/ Фланец	Flange 10 in, WN, 300#, RF, S-40, ASTM A105N, ASME B16.5	Pce	10,00	
14	040.002.04130	Flange 8”-300# RF WN Sch40 ASTM A105N, ASME B16.5 - Mặt bích/ Фланец	FLANGE, PIPE, TYPE: WELD NECK, MATERIAL: CARBON STEEL, MATERIAL STANDARD: ASTM A105N, DIMENSIONAL STANDARD: ASME B16.5, FACE: RAISED FACE, PRESSURE RATING: CLASS 300, WALL THICKNESS: SCH 40, NOMINAL PIPE SIZE: 8 INCH	Pce	3,00	
15	061.001.04153	STUD BOLTS C/W 2 HEX NUTSASTM A193 GR.B7 /		Pce	60,00	

		A194 GR.2H, FLUOROCARBON COATED 160.00 mm 1 in - Gudông kèm 2 đai ốc lục giác /Шпильки с 2 шестигранными гайками				
16	061.001.04108	5/8" 85 MM LENGTH STUD BOLTS FULLY THREADED WITH TWO HEX NUTS - шпильки - Gudông kèm 2 đai ốc lục giác /Шпильки с 2 шестигранными гайками		Set	16,00	
17	040.012.00943	U-Bolts M10 (3/8") for Pipe 2"; c/w 4 Nuts; SS316		Set	8,00	
18	037.024.01024	Round Bar Ø25mm; ASTM A36 - Сталь Круглая/ Thép tròn trơn	Round Bar Ø25mm; ASTM A36	Metre	34,65	
19	012.009.00206	M10 x 40mm DIA x 35mm LG Earth boss C.S, c/w 316 S.S threaded studs, nuts & washers. - Cục tiếp địa hàn xuống sàn/ Заземленный босс		Pce	4,00	

INSTALLATION OF A PRESSURE CONTROL VALVE (PCV) AT THE OUTLET OF THE DAI HUNG GAS COMPRESSOR

Approved by
Deputy General Director
"VIETSOVPETRO"

Signed by: Đặng Đức Phong
Date: 26/03/2026 09:32:15
Certified by: Vietsovpetro CA

DANG DUC PHONG

TECHNICAL REQUIREMENT FOR VALVES; PIPING; FITTING AND STRUCTURE MATERIALS

Project: Oil and gas contract for block 04-3

Rev : 0

ISSUE FOR BID

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1. PURPOSE AND SCOPE OF USE

- Purpose and scope of use: for Modifying the technology system on the BK.TNG platform to exploit the Thien Ung mine under reduced pressure conditions.
- Location and Environmental Conditions: The material will be installed on an offshore platform (BKTNG) where tropicalization (humidity, corrosion and heat) in the south of the coast of Vietnam.

2. TECHNICAL CONDITIONS AT THE EQUIPMENT OPERATING LOCATION

- Utility Data (Existing platform). VENDOR shall design and supply Good compliance:
  + Instrument Air:
    - Normal pressure: 5-7 barg.
    - Min./Max. pressure: 4 – 8 barg
  + Instrument and Control system power supply:
    - 400VAC, 50Hz, 3 phase
    - 230VAC, 50Hz, 1 phase.
    - 24 VDC.
- Location and Environmental Conditions:
  + Ambient Temperature (min./max.), ^{o}C: 21.0/ 39.0
  + Relative Humidity (min./max.), %: 62/ 98
  + Wind Velocity, m/s: 18.8
  + Rainfall, mm/hr: 50
  + Seismic, richter: 5

3. GENERAL REQUIREMENTS FOR GOOD

- The Good (included its components) must be brand new, unused and manufactured in the year 2025 or later.
- Bidder shall submit full technical details of this Bidder's furnished Good with detailed model or part number, manufacturer, Origin and quantity (no information or any information such as "or equal", "or equivalent" is not acceptable) of all item in **Appendix 1 - MATERIAL LIST**.
- The time of GOODs shall be as below:

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+ **Group 1**: Goods are furnished with Warranty Certificate for the period of 18 months from delivery of last portion of material or part or 12 months from commissioning, whichever comes earlier.
+ **Group 2**: Goods are furnished with Warranty Certificate for the period of 12 months from delivery of last portion of material or part.

4. STANDARDS AND COMPLIANCE WITH REGULATIONS

- Good shall be complied with all Technical Documents listed in **Appendix 2 - ATTACHMENT TECHNICAL DOCUMENTATION**.

5. TECHNICAL REQUIREMENT

- All goods shall be in accordance with **Appendix 1** and all Technical Documents listed in **Appendix 2.** In the event of any conflict between this Technical Requirement, Datasheet, Specification and other documents, the order of the precedence of the documents is as follows:
  + This Technical requirement
  + Data Sheets
  + Specification
  + Other documents
- Bidder is requested to submit the completed datasheet (apply for Group 1).

6. RECOMMENDED VENDOR LIST

The Recommended vendor list for skid component are listed in the table below:

No.	Good	Recommended Manufacturer
1.	Automated valve	- **Valve Body**: SRI; Insvalves; Valland; Topvalve; ICL; Keysung Metal; Alco; Erreesse; Bel Valve; Visvana; SAMI (WIKA); Invalves FLV; S&W; Zavero; Broady; Keysung Metal; Hanyang; DongKang Metal Valve; Technical SRL; Hawk Valve; Flowserve; DHV; Velan; Fisher; Starline; Ringo; Leser; Efsvalves; In Line Valve (ILV); CVS valves; Samsung Precision; Valvulas Fevisa; Valve Engineering Services (VES); General Valve

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		- **Actuator:** Bettis (Emerson); Flowserve; Bifold; Rotork; Ledeen-Schlumberger; HKC - **Solenoid valve:** Bifold / Rotork; Nadi; Asco; Versa; Maxseal; Midland-ACS - **Switches, Valve Position / Valve Limit:** Westlock Controls; GO (Emerson); Topworx (Emerson); Soldo Controls (Rotork) - **Regulators, Air Filters**: Norgren / Maxseal; Bifold / Rotork; Fisher (Emerson); Emerson Process; Masoneilan; Moore; Norgren - **Quick Exhaust Valve:** Sigma; Bifold - **Control Valve:** Fisher/Emerson; Masoneilan; Samson; Flowserve Valves; In Line Valve (ILV); Quam Valves; JVS Flow Control **Pneumatic Positioner:** Fisher (Emerson); ABB; Flowserve; Samson
2.	Manual Valve;	- **Manual Valve**: SRI, Insvalves,Valland, Topvalve, ICL, Keysung Metal, Alco, Erreesse, Bel Valve, Visvana, SAMI (WIKA), Invalves FLV, S&W, Zavero, Broady, Keysung Metal, Hanyang, DongKang Metal Valve, Technical SRL, Hawk Valve, Flowserve, DHV, Velan, Fisher, Starline, Ringo, Leser, Efsvalves, In Line Valve (ILV), CVS valves, Samsung Precision, Valvulas Fevis, Valve Engineering Services (VES), General Valve.
3.	Pipe; Fitting; Flanges; Bolt&Nuts; Gaskets; U-Bolts and Structure materials.	- **Pipe (Piping)**: V&M; NSSMC; Bentler; Tenaris; Turbos; EEW; SeAH; Dongyang; Nippon Steel; Van Leeuwen; JFE Steel; Tubacex; G. Fiori; Kawasaki; Mitsui; Soon Supply; Sumitomo - **Fitting, Flange**: PFC; SBC; Sam Sung Fitting; UMA; ST Eng; DHF; KMC; Kangsung Flange (KSF); SK Bend - **Bolt, Stud, Nuts**: Tristar; Beck Crawford; Chinyuan; Seng Heng; LoneStar; Lianseng; ABN; DYNO Engineering Edge; Mastercoat/Tristar; Rollstud; Southern Tristar; Steadfast

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		- **Gasket**: Karmsund; ConSeal; Flexiteck; Wolar; Foritex; Galperti; Klinger; Smith Gaskets - **Plate**: ArcelorMittal; JFE Steel Corp; Nippon Steel; Posco; Hyundai; DongKuk; Salzgittr Stahl; Corus / British Steel; Dillinger; Duferco Clabecq (Type 2); Edgen Murray; Marubeni –Itochu; Mitsui & Co. Ltd. (COP approved); Regency Steel; Samkang; Tenaris ThyssenKrupp; Mannesmann; Voest Alpine (COP approved). - **Beam & Shape**: JFE Steel Corp, Nippon Steel, Posco, Tenaris, V & M, Huyndai, Dongkuk, Celsa, Osaka, Mescier, Siam, Arcelor –Mittal, Corus / British Steel, Edgen Murray, Incheon Iron & Steel, Kawasaki Steel Co, Marubeni – Itochu Tubulars, Mitsui & Co. Ltd, Regency Steel, Sumitomo Corporation, ThyssenKrupp Mannesmann.

Note: In case the Manufacturer is not In the above Recommended Vendor List, Bidder shall submit Manufacturer's profile (manufacturing capacity, experience, manufacturing procedure, facility, certification system, similar contracts, etc) to envident.

7. EXPERIENCE

No.	Description	Group 1	Group 2	Remark
1	Bidder shall have at least 02 (two) similar executed contracts in the last 05 (five) years. Similar executed contracts are contracts supplying Automated Valve, Manual Valve, Special Item.	X		
2	Manufacturers shall have Valve body, Actuator /Manual valve design/ engineering experience at least 05 (five) years	X		In case Manufacturers are not in Vendor List
3	Integrators shall have integrating experience for automated valve at least 03 (three) years and have valid	X		for Automated Valves only

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No.	Description	Group 1	Group 2	Remark
	ISO 9001 Valve Automation certificate (or equivalent.)			

Note:

+ The symbol (**X**) in the table above is "Yes" required submission.

8. ORIGIN OF GOODS

The Recommended country of origin for the Good shall be listed in the table below:

Description	Recommended country of Origin
Group 1: Automated Valve; Manual Valve;	**For Automated Valve:** - The country of origin of Valve and Actuator is recommended from G7, Russia, Europe, Australia, Korea, Singapore, Malaysia, Thailand. The raw material for Valve and Actuator is recommended from Europe, G7, Russia, Australia, Korea, Singapore, Malaysia, Thailand, Viet Nam. - The country of origin of other Equipment/Accessories (Filter/Regulator, Pressure gauge, Solenoid, Limit Switch, Positioner, Tubing, Fitting, Pneumatic valves) is recommended from G7, Russia, Europe, Australia, Korea, Singapore, Malaysia, Thailand, Indonesia, Viet Nam. - The country of origin of Completion of Control Valve (Integrator of valve and actuator) is recommended from Europe, G7, Russia, Australia, Korea, Singapore, Malaysia, Thailand, Viet Nam which have authorization/license for integrator from Valve Body Manufacturer & Actuator Manufacturer and ISO 9001 for Valve Automation or Equivalent. **For Manual Valve:** Europe, G7, Russia, Australia, Korea, Singapore, Malaysia, Thailand
Group 2: Pipe; Fitting; Flanges; Bolt & Nuts; Gaskets; U-Bolts and Structure materials.	Europe, G7, Russia, Australia, Korea, Singapore, Malaysia, Thailand, Viet Nam

The detailed evaluation is referenced in Technical Bid Evaluation attached.

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9. TIME AND LOCATION OF DELIVERY

- All GOODS shall be delivered at Vietsovpetro warehouse, No.67, 30/4 Road, Rach Dua Ward, Ho Chi Minh City, S.R Viet Nam.

Delivery time of GOODs (included vendor data review, packing/handling, shipping, transportation time) shall be as below:

- **Group 1**: not later than **120 calendar days** after issue of Letter of Intent (LOI).
- **Group 2**: not later than **84 calendar days** after issue of Letter of Intent (LOI).

- **Note**: BIDDER/VENDOR has to follow Vietsovpetro's HSE policy when delivery goods to Vietsovpetro warehouse/port and work at onshore/offshore site.

10. QUANTITY AND PACKAGING

- Quantity: Bidder shall quote enough quantity for each Group in **«DANH MỤC HÀNG HOÁ – PURCHASE ORDER LIST - СПЕЦИФИКАЦИЯ» in ITB**.
- Packing: The goods must be protected in accordance with international standard for export packing to ensure safety of goods from damages and corrosion during transportation and suitable for crane operations and handling. Bidder shall comfirm to comply with all Technical Documents listed in Appendix 2.

11. TECHNICAL DOCUMENTATION REQUIREMENTS

- Bidder is requested to submit a complete of Technical Documentations as a part of its bid document and the minimum requirements as below:

No.	Document	Group 1	Group 2
1.	Scope of Supply with detailed model or Part No, manufacturer, Origin (Valve, Actuator, Accessories, Integrator) and quantity. (No information or any information such as "or equal", "or equivalent" is not acceptable). **Bidder to specify Ex-mill or Ex-stock for each item in the Detailed scope of supply table.**	X	X
2.	Detailed model or part number, manufacturer, Origin and quantity (no information or any information such as "or equal", "or equivalent" is not acceptable) of all major component (Valve body, Actuator, Regulator,	X	

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No.	Document	Group 1	Group 2
	Postioner, Switch, Instrument ,…) within Automated valve		
3.	Valid API 6D / API 6A / BS 5352 / ASME B16.34 / API 602/ API 623 certificate (copy)	X	
4.	Fire safe test certificate API 607/ API 6FA/ API 6FB/ BS6755-2/ ISO 10497/ BS EN12266 (True-Copy for sample)	X	
5.	ISO 9001 for Valve Automation or Equivalent (for Integrator)	X	
6.	Full fill Datasheet according to the VSP's Datasheet form stamped and signed by Manufacturer.	X	
7.	Sizing or Calculation sheet stamped and signed by Manufacturer	X (AT Valve)	
8.	Inspection and Test Plan (ITP) as per Company's Specification (Sample)	X	
9.	Control Schematic drawing and Hook-up Drawing	X (AT Valve)	
10.	Equipment General Arrangement drawing (dimension of equipment).	X	
11.	Manufacturer specifications and catalogue	X	X
12.	List of Bidder's similar executed contracts in the last 05 (five) years and Bidder's Copied similar executed contracts with detailed scope of supply.	X	

Note:

+ The symbol (**X**) in the table above is "Yes" required submission.
+ Bidder also shall be full responsibility to submit for Vendor data register list (VDRL) to Company for review/approval after LOI.

- Request for technical documentation upon delivery: Bidder shall provide all necessary documents, including but not be limited to use manual, technical documents, lifting/ transporting guideline…

12. REQUIREMENTS FOR CERTIFICATES OF THE GOODS

All relevant certificates must be confirmed or committed to provide and to be submitted before delivery, but not limited to:

No.	Certificate	Group 1	Group 2

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1.	Certificate of quality, quantity issued by Manufacturer for Ex-mill items / issued by the Supplier/Authorized distributor for Ex-stock items.	**Original** (Automated Valve, Valve body, Actuator, Positioner, Accessories) (Manual Valve)	X
2.	Certificate of Origin issued by the Commerce Department of Manufacturer's country or Export country (Original or Electronic Cert)	X	X
3.	Fire safe certificate as per Datasheet issued by third party.	**True copy** (Ball valves)	
4.	Material certificate in accordance with BS EN 10204 Type 3.1 issued by Mills	**True copy** (Valve body, Actuator)	**Original for Ex-mill / Original or True-copy for Ex-stock**
5.	Certificates of Explosion protection and Ingress Protection issued by third party.	**True copy** (Solenoid, Limit Switch, Positioner)	
6.	Hydrostatic testing and leak test to API 598 issued by manufacturer, endorsed by third party.	**Original** (Manual Valve)	
7.	Hydrostatic testing to API 598 and Seat leakage test to ANSI/FCI-70.2 issued by manufacturer, endorsed by third party.	**Original** (Automated Valve PCV)	
8.	Inspection/ Testing (Visual, Dimension, Flange face finish checking, Speed of response, NDT, Painting, Function) report issued by manufacturer as per specifications.	**Original**	
9.	FAT certificate issued by TPI (Third party Inspection - shall be DNV-GL / BV / ABS / Lloyds Register / VR)	**Original** (Automated Valve)	
10.	Certificate of Warranty issued by Bidder	**Original**	**Original**

Note:

+ **True-copy**: Certified copy by manufacturer/ final fabricator/ authorized distributor/ exporter.
+ **Electronic**: Electronic certificates can be checked in the website.
+ Goods are made in Vietnam do not need to provide Certificate of Origin.

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+ Mill certificates just request BS EN 10204: 2004 Type 3.1 and ISO 10474 Type 3.1.

- Other certificates as per datasheets, specifications listed in Appendix 2: Technical Documents.

13. TECHNICAL PROPOSAL EVALUATION METHOD

The technical proposal will be evaluated for **each Group** following attached Technical Bid Evaluation.

14. APPENDIX LIST

- Appendix 1: MATERIAL LIST (for technical description only)
- Appendix 2: ATTACHMENT TECHNICAL DOCUMENTATION

(Appendix 2 may be updated and complemented during bidding stage.)

Văn bản này được xác thực tại https://eoffice.vietsov.com.vn với số định danh: 907/26-CV-PQLDA/XL

APPENDIX 2

ATTACHMENT TECHNICAL DOCUMENTATION

Download link: https://drive.google.com/drive/folders/1Ys1aHQZ-VIfNuo-LLPFMvjomxBfcO3as

No.	Document No.	Document title	Revision
1	BK.TNG-001-TS-PI-SP-001	Piping material specification	
2	BK.TNG-001-TS-PI-SP-002	Specification for Manual Valves	
3	VSP-NIPI-TYP-TS-PI1-SP-06	Specification for Pipe Support	
4	VSP-NIPI-TYP-GE-ST3-SP-03	Specification for Structural Steel Materials	
5	BK.TNG-001-GEN-AZ-SP-02	Painting specification for platform BK.TNG	
6	VSP-NIPI-TYP-GE-AC7-SCH-01	Basic painting schedules for platform	
7	VSP-NIPI-TYP-TS-PI1-GEN-01	Pipe Support Standard	
8	BK.TNG-001-TS-PI-DS-002	Datasheet for Ball Valve BACA6L	
9	BK.TNG-001-TS-PI-DS-002	Datasheet for Ball Valve BABD4G	
10	BK.TNG-002-TS-PI-DS-008	Datasheet for Mono Flange Valve MVBAAT	
11	VSP-NIPI-TYP-TS-PI1-DS-100	Datasheet for U-bolt support	
12	BK.TNG-087-TS-PI1-DS-001	Data Sheet For PCV	
13	BK.TNG-087-TS-PR1-CA-001	Control Valve Sizing Calculation	

Note: *Attachment documents may be updated and complemented during bidding stage.*

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DETAIL ENGINEERING SERVICE FOR BK.TNG WELLHEAD PLATFORM

PROJECT NAME : **DETAIL ENGINEERING SERVICE FOR BK.TNG WELLHEAD PLATFORM**

DOCUMENT TITLE : **PIPING MATERIAL SPECIFICATION**

DOCUMENT No. : **BK.TNG- 001-TS-PI-SP-001**

CONTROLLED

REV.	DES.	DATE	PREPARED	CHECKED	AGREED	DIS. LEADER	ENG. MANAGER	PRO. MANAGER
6	IFA	09/02/2015						
5	IFA	24/11/2014	N.V.THANG	L.T.DUONG		N.T.HAI	P.H.VIET	L.V.DZUNG
4	IFA	01/10/2014	N.V.THANG	L.T.DUONG		N.T.HAI	P.H.VIET	L.V.DZUNG
3	IFA	20/08/2014	N.V.THANG	L.T.DUONG		N.T.HAI	P.H.VIET	L.V.DZUNG
2	IFA	31/07/2014	N.V.THANG	L.T.DUONG		N.T.HAI	P.H.VIET	L.V.DZUNG

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1.0 GENERAL

1.1 Background

The Thien Ung field is located in the middle part of Block 04.3 in the Nam Con Son Basin, offshore the Socialist Republic of Vietnam, approximately 15 km of Dai Hung field and approximately 270 km southeast of Vung Tau. The block 04.3 covers an area of approximately 2600 km2. The Thien Ung field is including its 2 structural part. Thien Ung structure discovery was made in 2004 with the 04.3-TU-1X well. Two subsequent appraisal wells (04.3-TU-2X and 04.3-TU-3X), drilled and tested respectively, delineated the field.

Location of Thien Ung field is shown in Figure 1.1 below.

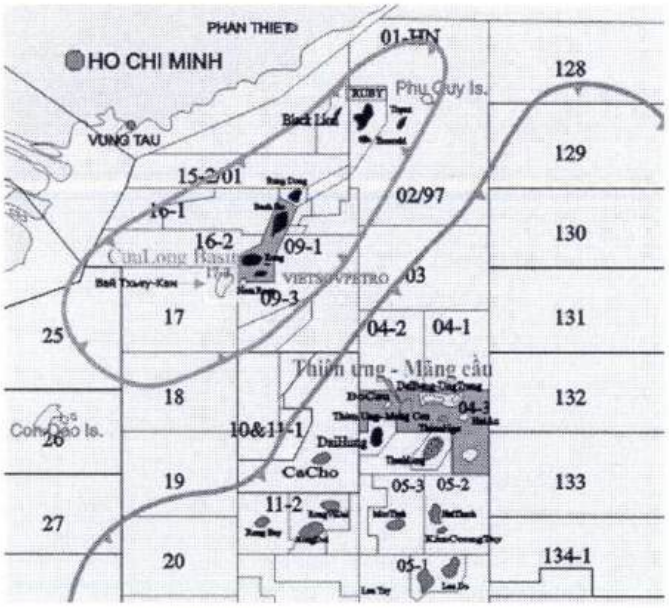


Figure 1.1: Thien Ung Reservoir Location

1.2 Purpose of document

This specification defines the minimum requirements for materials and manual valves for process and utility piping for the BK.TNG Wellhead Platform, and is to be used in conjunction with the data sheets, drawings, related specifications, referenced international codes and standards. It follows the intent of ASME B31.3 for all piping facility.

However, piping system furnished as a regular part of equipment or package shall be in accordance with design conditions of equipment manufacturer's standards.

1.3 Abbreviations

1.3.1 Definitions

PROJECT	Detail Engineering service for BK.TNG Wellhead Platform
COMPANY	The party which initiates the project and ultimately pays for its design and construction and owns the facilities. Here the COMPANY is Vietsovpetro (Referred to as VSP)
DESIGNER	The party which carries out all or part of the design, engineering, procurement, construction and commissioning of the project. Here the DESIGNER is a joined Team between Research and Engineering

Institute (R&EI), a subsidiary of VSP, and an outside contractor.

VENDOR — The party on which the order or contract for supply of the equipment / package or services is placed

1.3.2 Abbreviations

BK.TNG	Thien Ung Wellhead Platform
FEED	Front End Engineering Design
NCS2	Nam Con Son 2
R&EI	Research and Engineering Institute
TPGM	TechnipGeoproduction (M) SdnBhd
VSP	Vietsovpetro
ASME	American Society of Mechanical Engineers
API	American Petroleum Institute
BS	British Standards
ISO	International Standardization Organization
MSS	Manufacturers Standardization Society
ASTM	American Society for Testing and Materials
EEMUA	Engineering Equipment & Materials User's Association
P&ID	Piping and Instruments Diagram
NPT	National Pipe Thread
CS	Carbon Steel
SS	Stainless Steel
GRE	Glass Reinforced Epoxy
CPVC	Chlorinated Polyvinyl Chloride
CORR.	Corrosion
CONC./ ECC.	Concentric/ Eccentric
Gr.	Grade
LR	Long Radius
NPS/ DN	Nominal Pipe Size/ Diameter Nominal
PTFE/ RPTFE	Poly Tetra Fluoro Ethylene
FF/RF/RTJ	Flat Face/ Raised Face/ Ring Type Joint
SCH	Schedule
STD	Standard (wall thickness)
THK	Thickness
SPW	Spiral wound
ERW	Electric Resistance Welding
NDT	Non-Destructive Testing

1.4 Reference Documents

The design of piping systems shall be in accordance with latest edition of, but not limited to, the documents and standards list below including any applicable normative references:

1.4.1 International Code and standard:

ASME Standard:

Code	Title
ASME B1.1	Unified Inch Screw Thread
ASME B1.20.1	Pipe Threads, General Purpose
ASME B16.5	Pipe Flanges and Flanged Fittings (NPS ½" Through NPS 24")
ASME B16.9	Factory Made Wrought Steel Butt welding Fittings
ASME B16.10	Face to Face and End to End Dimensions of Valves
ASME B16.11	Forged Steel Fittings, Socket Welding and Threaded
ASME B16.20	Metallic Gaskets for Pipe Flanges - Ring Joint, Spiral Wound and Jacketed
ASME B16.21	Nonmetallic Flat Gaskets for Pipe Flanges
ASME B16.22	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
ASME B16.24	Cast Copper Alloy Pipe Flanges and Flanged Fittings: Class 150, 300, 400, 600, 900, 1500 and 2500
ASME B16.25	Butt welding Ends
ASME B16.34	Valves - Flanged, Threaded and Welding End
ASME B16.36	Orifice Flanges
ASME B16.47	Large Diameter Steel Flanges, NPS 26" Through NPS 60"
ASME B16.48	Line Blanks
ASME B16.49	Factory-Made, Wrought Steel, Butt welding Induction Bends for Transportation and Distribution System.
ASME B18.2.1	Square and Hexagonal Bolts and Screw
ASME B18.2.2	Square and Hexagonal Nuts
ASME B31.3	Process Piping
ASME B31.4	Liquid Transportation Systems for Hydrocarbons
ASME B31.8	Gas Transmission and Distribution Piping System
ASME B36.10M	Welded and Seamless Wrought Steel Pipe
ASME B36.19M	Stainless Steel Pipe
ASME B46.1	Surface Texture
ASME BPVC Section II	Material- Part A: Ferrous Material Specifications
ASME BPVC Section II	Material- Part C: Specifications for Welding Rods, Electrodes and Filler Metals
ASME BPVC Section V	Non Destructive Testing
ASME BPVC	Welding and Brazing Qualification

Code	Title
Section IX	

API Standard:

Code	Title
API 5L	Specification for Line Pipe
API 6A	Specification for Wellhead and Christmas Tree Equipment
API 6D	Specification for Pipeline Valves
API 6FA	Specification for Fire Test for Valves
API 598	Valve Inspection and Testing
API RP14E	Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems
API 15LR	Specification for Low Pressure Fibre Glass Line Pipe
API 594	Wafer and Wafer-Lug Check Valves
API 600	Steel Gate Valves, Flanged and Butt welding Ends
API 602	Steel Gate, Globe and Check Valves for sizes DN100 and smaller for Petroleum and Natural Gas Industries
API 607/ ISO 10497	Fire Test for Soft-Seated Quarter Turn Valves
API 609	Lug and Wafer Type Butterfly Valves

BS Standard:

Code	Title
BS 1873	Specification for Steel Globe Valves
BS 6755	Testing of Valves (Parts 1 and 2)
BS EN ISO 14692	Glass-reinforced Plastics Piping
BS EN ISO 15761	Specification for Steel Wedge Gate, Globe and Check Valves DN100 & Smaller for the Petroleum, Petrochemical and Allied Industries
BS EN ISO 17292	Specification for Steel Ball Valves for Petroleum and Allied Industries
BS EN ISO 10204	Metallic Products – Types of Inspection Document

MSS Standard:

Code	Title
MSS SP-6	Standard Finishes for Contact Faces of Pipe Flanges and Connecting – End Flanges of Valves and Fittings
MSS SP-25	Standard Marking System for Valves, Flanges, Fittings and Unions
MSS SP-55	Standard for steel castings for Valves, Flanges, Fittings and Other piping components. (Visual Methods)
MSS SP-67	Butterfly Valves
MSS SP-75	Specification for High Test Wrought Butt Welding Fittings

Code	Title
MSS SP-80	Bronze Gate, Globe, Angle and Check Valves
MSS SP-95	Swage (d) Nipples and Bull Plugs
MSS SP-97	Integrally Reinforced Forged Branch Outlet Fittings – Socket Welding, Threaded and Butt welding Ends

ASTM Standard:

Code	Title
ASTM A105	Carbon Steel Forgings for Piping Components
ASTM A106	Seamless Carbon Steel Pipe for High Temperature Service
ASTM A182	Forged or Rolled Alloy Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High Temperature Service
ASTM A193	Alloy Steel and Stainless Steel Bolting Materials for High Temperature Service
ASTM A194	Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service
ASTM A216	Carbon Steel Castings Suitable for Fusion Welding for High Temperature Service
ASTM A234	Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
ASTM A240	Heat Resisting Chromium and Chromium Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels
ASTM A276	Stainless Steel Bars and Shapes
ASTM A285	Carbon Steel Pressure Vessel Plate of Low and Intermediate Tensile Strength
ASTM A312	Seamless and Welded Austenitic Stainless Steel Pipes
ASTM A320	Alloy Steel Bolting Materials for Low Temperature Service
ASTM A333	Seamless and Welded Steel Pipe for Low Temperature Service
ASTM A350	Carbon and Low-Alloy Steel Forgings Requiring Notch Toughness Testing for Piping Components
ASTM A351	Austenitic and Duplex Castings for Pressure Containing Parts
ASTM A352	Ferritic and Martensitic Steel Castings for Pressure Containing Parts Suitable for Low Temperature Service
ASTM A358	Standard Specification for Electric Fusion Welded Austenitic Chromium Nickel Alloy Steel Pipe for High Temperature Service
ASTM A403	Wrought Austenitic Stainless Steel Piping Fittings
ASTM A420	Wrought Carbon and Alloy Steel Piping Fittings for Low Temperature Service
ASTM A494	Nickel and Nickel Alloy Castings
ASTM A516	Carbon Steel Pressure Vessel Plate for Moderate and Lower Temperature Service
ASTM A671	Standard Specification for Electric Fusion Welded Steel Pipe for

Code	Title
	Atmospheric and Lower Temperature
ASTM A694	Carbon and Alloy Steel Forgings for Pipe Flanges, Fittings, Valves and Parts for High Pressure Transmission Service
ASTM A860	High Strength Butt welding Fittings of Wrought Low Alloy Steel
ASTM B88	Seamless Copper Water Tube
ASTM B117	Test Method of Salt Spray (Fog) Testing
ASTM B148	Aluminium Bronze Sand Castings
ASTM B466	Seamless Copper-Nickel Pipe and Tube
ASTM D1784	Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D1785	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120
ASTM D2996	Standard Specification for Filament-Wound "Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
ASTM D2466	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
ASTM F441	Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80
ASTM F439	Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
ASTM G48	Standard Test Methods for Pitting and Crevice Corrosion Resistance of Stainless Steels and Related Alloys by Use of Ferric Chloride Solution
ASTM E562	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count

Other Standard:

Code	Title
NACE MR0175	Petroleum and Natural Gas Industries Materials for Use in H_2S
UKOOA	UK Offshore Operators Association
EEMUA 144	90/10 Copper Nickel Alloy Piping for Offshore Application Specification: Tube Seamless and Welded

1.4.2 Project Documents

Document No.	Title
BK.TNG-001-TS-PI-CN-001	Wall Thickness Calculation
BK.TNG-002-GEN-PI-SP-005	Piping Design Standard
BK.TNG-002-GEN-PI-SP-004	Insulation Specification
BK.TNG-001-TS-PI-SP-002	Specification for Manual Valves
1014-BKTNG-MC-RPT-0001	Material Selection and Corrosion Philosophy Report

Document No.	Title
BK.TNG-001-GEN-AZ-SP-02	Painting Specification for BK.TNG
BK.TNG-001-TS-PR-PID	P&IDs

1.4.3 Order of Precedence

In the event of any conflict between this Specification, other project specification, international codes and standards, the more stringent requirement shall apply.

1.5 Units

All units shall be expressed in SI (for ease of the users).

All piping sizes shall be expressed by nominal sizes DN – mm unless otherwise noted

2.0 GENERAL REQUIREMENTS

CONTRACTOR shall develop detail buying description for all components required for the project. All such buying description shall be subjected to COMPANY review and approval.

Pressure/ temperature ratings of flanged components DN15 through DN600 are based on ASME B16.5 and ASME B31.3. Pressure/ temperature ratings of flanged components larger than DN600 are based on ASME B16.47 Type B. All pressures indicated in the Piping Class Material Specification are gauge values unless noted otherwise.

Flange dimensions, surface and hole of bolts shall comply with ASME B16.5 for diameter DN600 and below; ASME B16.47 Series B for DN650 and above.

Following flange facing shall be followed:

- Flat face (FF) for GRE, CPVC, Copper Nickel Materials
- Raised face (RF) for class 150 to class 600
- Ring Joint (RTJ) for API flanges and ASME class 900 and class 1500.
- Insulating gaskets/sleeves shall be provided when dissimilar materials are connected/ flanged.
- Higher flange rating class shall be selected when there is a class break with lower rating class, the wall thickness and inside diameter of flange shall be match that of pipe.

Pipe, valves and fittings in sizes: DN8, DN10, DN32, DN65, DN90, DN125 and DN550 shall not be used. Where a vendor normally provides equipment with connections in any of the above sizes, connections will be made with suitable swages or reducers to pipe of approved size.

Threaded joints are only permitted for instrument and tubing connections and bleed ring for upstream / downstream of piping isolation valves. The use of threaded joints shall be kept to a minimum

Threads for screwed pipes, fittings, flanges and valves shall be in accordance with ASME B1.20.1 taper threads.

PTFE jointing tape is only permitted in piping systems containing utility fluids such as air, water, etc.

With the exception of liquefied gases, sampling connections and chemical injection to piping shall be made with a flanged double block and bleed valve with integral lance. Injection valves shall incorporate a check valve and injection probe, whilst sampling connections should incorporate a sampling probe.

Valves for bleed rings shall consist of a minimum size DN20 screwed end connection valve and nipple contained in the same forging. The valve type shall be as shown on the P&ID and be complete with a threaded plug. Where shown in the P&ID an integral double block valve shall be included.

The use of spectacle blinds, spade/spacers shall follow table given below unless otherwise specified:

SIZE	150#	300#	600#	900#	1500#	2500#	API 10000
Up to DN80	SP	SP	SP	SP	SP	SP	SD
DN100 to DN150	SP	SP	SP	SP	SP	SP	SD
DN200 to DN250	SP	SD	SD	SD	SD	SD	-
Above DN300	SD	SD	SD	SD	SD	SD	-

SP = spectacle blind SD = spade /spacer

When the use of a removable spool is not feasible due to space constraint, spectacle blind, spade/ spacer may be used, subject to COMPANY approval.

2.1 Requirements for Pipes

Dimension and wall thickness for steel pipe shall conform to ASME B36.10M or B36.19M as applicable.

All pipes shall be submitted to a mill hydrotest.

All pipes shall be provided with a product analysis/ test certificates.

All welded pipe shall have a single longitudinal seam. Double seam and Helical seam pipe is specifically prohibited.

The pipe weld shall be 100% radiographed to meet the requirements of ASME B31.3 table 302.3.4

ERW pipe is specifically prohibited.

Weld repairs of parent pipe material is not permitted and shall not be allowed.

Jointers shall not be used.

In order to minimize site welding all pipe DN50 and larger shall be supplied in double random lengths.

Pipe shall be supplied in single or random length of 6 and 12 meters respectively.

2.1.1 Carbon Steel Pipe:

All seamless C.S. pipe for design temperatures above 0°C shall be supplied in the normalized condition excepting that hot finishing is acceptable provided certification is provided that hot forming was conducted in the range 777°C to 949°C followed by cooling in still air.

All welded C.S pipe for design temperatures above 0°C may be supplied in either as rolled or normalized condition, with a maximum cold expansion of 1.5%.

All carbon steel pipe for design temperature below 0°C shall be supplied normalized or in an alternative heat treated condition approved by the COMPANY.

Pipe shall be seamless is 16" and below, welded pipe is 18" and above.

Welded pipe in accordance with API 5L shall be submerged arc welded with at least one pass on both the inside and outside.

Impact testing on materials for pipes, heat-treated fittings, flanges and valves shall be carried out and certified. The basis shall be one fitting / one flange for each size / form / type in every heat (or in every heat treatment lot if this occurs more frequently). The Charpy V-notch impact testing shall be carried out in accordance with ASTM A370. The minimum acceptable Charpy toughness shall be an average, from three specimens, of 45J minimum average with 37J minimum individual for X60 and X65 materials. The indicated energy levels are the minimum requirements. If the material specification requires a higher value, the same shall be complied with. The impact test temperature/ wall thickness shall be meet the requirements of ASME B31.3 Para. 323.3

2.1.2 Stainless Steel Pipe:

All materials shall be in accordance with ASTM A312 dual-stamped to type 316/316L with a minimum Molybdenum content of 2.5%. All materials shall possess the weldability equivalent to that of type 316L with enhanced mechanical properties as that of type 316

Pipe shall be seamless is 6" and below, welded pipe is 8" and above.

All pipes shall be supplied in the solution heat treated condition, de-scaled, pickled, and passivated. Positive Material Identification (PMI) shall be carried out for all austenitic stainless steel pipes and fitting materials. Refer to section 4.0 of this document.

2.1.3 GRE Pipe:

All fabricated joints shall be Spigot/ socket or butt & strap type

Wall thickness shall be as per Manufacturer's standard for select design conditions

Pipe length shall be as per manufacturer's standard

It is a requirement that the GRE Vendor be selected at an early stage in the detailed design in order to provide the necessary input into project piping design. Unless specifically authorized by the COMPANY all GRE piping on the project shall be supplied by one Vendor.

GRE Pipe Vendor's responsibilities shall, in general, include supply of materials, design, installation, inspection and testing. CONTRACTOR shall determine and develop, in conjunction with GRE Pipe Vendor, all necessary interfaces to ensure smooth implementation.

COMPANY shall be permitted unrestricted access to the selected GRE vendor and his sub-contractors at all times.

2.1.4 Cu-Ni Pipe:

All fabricated joints shall be bevel or plain end

Wall thickness shall be based on table 1.2.2 and table 2.2.2 for 20 bar rating of EEMUA 144. Manufacturer to verify and confirm wall thickness during Detail Engineering Design.

Pipe shall be seamless for 14" and below and welded pipe is 16" and above.

2.1.5 C-PVC Pipe:

All fabricated joints shall be plain & socket end

Wall thickness shall be based on table X1.2 of ASTM F441/ F441M-09 Manufacturer to verify and confirm wall thickness during Detail Engineering Design

Pipe length shall be as per manufacturer's standard

2.2 Requirements for Fittings and Flanges

All wrought fittings for pressure pipe shall be as per pipe seamless and welded range. Use seamless fittings for the following sizes: CS up to DN 400, SS up to DN 150 and LTCS up to DN 600. Use welded fittings for the following sizes: CS ≥ DN 450, SS ≥ DN 200 and for LTCS ≥ DN 650. All welded fittings shall be fully radiograph or similarly tested to guarantee a joint factor of 1.0

Subject to COMPANY approval mitered joints may be used for large diameter ducting running at essentially atmospheric conditions in non hydrocarbon service. Cut and shut type joints are prohibited.

All carbon steel flanges and fittings shall be supplied in the normalized condition.

No repairs by welding to fittings are permitted.

Short radius elbows shall not be used unless specifically authorized by the COMPANY. In any such case the reduced pressure rating of these fitting shall be accounted for.

A magnetic particle test for carbon steel materials and dye penetrant test for other materials shall be made on all weld ends to ensure these are free from laps cracks and laminations.

For weld end thickness greater than 20mm an ultrasonic test extending a minimum 25mm from the weld preparation shall be made to ensure the area is free from laminations.

All API 6B or 6BX flanges shall meet quality control PSL4 TO API 6A.

All fittings and flanges shall be provided with a product analysis.

Fittings shall conform to the requirements of the following standards and any special requirements noted in individual piping class for the materials i.e. Carbon Steel, Low Temp. Carbon Steel and Stainless Steel.

Wall thickness at the ends of butt welded fittings shall be equal to the thickness of connected pipe.

All high strength carbon steel flanges and fittings may be supplied with the heat treatment condition in accordance with ASTM code and MSS SP 75.

Flange larger than DN600 not covered in ASME B16.47 and flanges ≥ DN350 Class 2500 not covered in ASME B16.5 must be calculated to ASME Section VIII Div. 1 Appendix 2.

2.3 Requirements for Bolting

Bolting shall conform to ASME B1.1, ASME B18.2.1 and the relevant ASTM standards. Nuts shall conform to ASME B18.2.2

Stud bolts/ bolts shall have the equivalent of one extra nut length added to the overall length if hydraulic tensioning is required. The extra length of bolt to be suitably protected (i.e. one extra nut to be provided to aid protection).

All piping class (all services): bolt tensioning will be required for bolt size of DN40 (1 ½") and above.

2.3.1 Zinc plated fluorocarbon coated bolting: Prequalification

Prior to acceptance to supply zinc plated fluorocarbon coated bolting the supplier shall provide satisfactory evidence of their ability to produce a satisfactory product for COMPANY approval. As a minimum this shall include.

- Users reference list of previous services.
- Proposed application and testing procedures.
- Salt fog exposure tests showing the bolting to be corrosion free and nut removable after a minimum 1000 hour exposure.

2.3.2 Zinc Plating

The plating shall be carried out in accordance with ASTM B767 in the range of 2-5 g/m2. Where alternative plating methods are being used, the Vendor shall submit full details and obtain COMPANY approval in writing before plating commences.

The plating thickness shall be min. 25 µm excepting that thicker plating is acceptable provided it does not compromise thread accuracy.

2.3.3 Fluorocarbon Coating (for use in conjunction with Zinc Plating)

The fluorocarbon used shall be polytetrafluoroethylene together with polyamide / imide ester and colouring pigment and shall be the bake cure type. Where alternative coating materials are being used, the CONTRACTOR / Vendor shall submit full details and obtain COMPANY / Purchaser approval in writing before coating commences.

The dry film thickness of the PTFE coating on the bolting components shall not be less than 25 microns and not greater than 40 microns.

2.3.4 For ease of identification, the coated bolting to be colour coded as follows:

ASTM A193-B7/ A194-2H – Blue

ASTM A320-L7/ A194-4L – Green

ASTM A453-660/ A453-660 – Grey

2.4 Requirements for Gaskets

All gaskets to be asbestos free

Flat ring gasket dimensions shall be in accordance with ASME B16.21

Spiral wound and ring joint gasket dimensions shall be in accordance with ASME B16.20

Spiral wound gaskets shall have an inner and outer ring as per Piping Class

Maximum hardness for soft Iron stainless steel ring joint gaskets shall be 90 and 160 BHN respectively.

2.5 Requirements for manual valves

Refer to the doc. No. BK.TNG-001-TS-PI-SP-002 Specification for Manual Valves

3.0 MATERIALS

3.1 General Material Requirements

All materials shall be new and identifiable against their certification.

All components shall be suitable for installation in a saliferous tropical marine environment and for a design life of 25 years.

All materials shall be in accordance with the relevant ASTM standard or equivalent approved by the COMPANY.

Packing materials containing asbestos shall not be used.

Bar stock material shall not be used for the fabrication of pipe fittings or valves, including modular valves.

All forgings and castings shall be normalized or quenched and tempered condition

All carbon steel and alloy materials under insulation shall be painted in accordance with the doc. No. 1014-BKTNG-MC-SP-0001 Painting and Coating Specification.

3.2 Carbon Steel

The Carbon Equivalent for carbon steel intended for welding shall not exceed 0.43% based on the long formula.

$$CE = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

The maximum carbon content for carbon steel plate and pipe materials shall be 0.23% by ladle analysis. The carbon content of forgings shall not exceed 0.25%.

The used of rimming steel is not permitted.

3.3 Austenitic Stainless Steel

The used of austenitic stainless steel is limited to a maximum temperature of 60°C due to Chloride Stress Corrosion Cracking tendency. External painting is required if temperature exceeds the maximum requirements.

All austenitic stainless steel shall be grade 316/316L.

All austenitic stainless steel shall be supplied in a solution annealed condition. No welding or working of the material is permitted after this treatment.

All welds made to stainless steel components shall be pickled and passivated. Radiography or alternative NDT shall be conducted to ensure a joint factor of 1.0.

All threaded joints shall be treated with a suitable anti-galling compound.

Any hydrostatic testing of austenitic stainless steel shall be conducted with Chloride content in water use for pressure test should be maximum 30 ppm, and any open ends sealed after drying to ensure no moisture ingress.

3.4 Cu-Ni

Cu-Ni material shall be a nominal 90/10 Cu-Ni-Fe composition complying with UNS C70600 and ASTM B466 with the following limitations: Percentage of carbon shall be 0.05% (max), Zn- 0.5% (max) and Pb-0.02% (max).

Pipe shall be supplied in the annealed condition. Dimensions shall be in accordance with EEMUA publication No 144. The nominal EEMUA rating for wall thickness sizing shall be "20 bar" as a minimum. 100% internal visual inspection shall be performed to confirm the absence of manufacturing defects.

3.5 GRE

GRE piping component design shall be based on the manufacturing process of filament winding using epoxy resins to impregnate strands of continuous glass filaments which are wound around a mandrel at a prescribed helix angle and under controlled tension. Fiber reinforcement shall be E-glass but other reinforcements such as C, R, S and ECR may be used to enhance product performance. Unless agreed otherwise, adhesives for bonded connections shall be of a conductive epoxy type and shall be heat resistant and suitable for the specified service.

Design, Supply, Fabrication and Testing of GRE piping system shall comply with the requirements of UKOOA / API 15LR.

GRE piping system shall be properly designed to eliminate the static electricity as required. Care shall be taken to prevent piping from any surface degradation due to Ultra Violet radiation exposure. GRE piping is susceptible to impact damage and the need for the shielding shall be reviewed and provided as required.

GRE piping for wet fire water system shall meet the requirements of IMO resolution A753 (18) for level 3.

The Vendor shall provide all components, complete with all materials and equipment, required for the complete system including:

- Pipes
- Fittings and flanges; all flanges shall be filament wound.
- Bolting, gaskets and the necessary backing rings for GRE piping connections.
- Pipe supports, including all guides, anchors, trunnions, saddles etc. in direct contact with the GRE pipe.
- Adhesive, consumables and joint preparation materials for installation onshore and for any site hook up.
- All pipe, flanges and fittings shall comply with the specified pressure rating as per piping specifications.

3.6 Plastic Pipe

C-PVC pipes shall meet the requirements of ASTM D1784 and the fittings shall be as per ASTM F439. C-PVC is normally solvent cemented. Since C-PVC piping system is susceptible to mechanical impact, the requirement of shielding of the piping system shall be reviewed and provided as required.

3.7 Duplex Stainless Steel

Unless otherwise stated duplex stainless steel shall be UNS S31803. Mixing different types of duplex stainless steel (e.g. 25% Cr) is prohibited without specific authorization from the COMPANY.

The minimum Pitting Resistance Equivalent (PRE) shall be 34 as determined from the following formula:

PRE = % Cr + 3.3 x % Mo +16 x % N.

The minimum nitrogen content shall be 0.15% by weight.

All duplex stainless steel shall be supplied in a solution annealed condition. No welding or working of the material is permitted after this treatment.

All welds made to duplex stainless steel components shall be pickled and passivated. Radiography or alternate NDT shall be conducted to ensure a joint factor of 1.0.

Any hydrostatic testing of duplex stainless steel shall be conducted with water containing less than 2 mg/kg chlorides, and any open ends sealed after drying to ensure no moisture ingress.

Specimens from base material and HAZ and weld material when applicable for each heat or lot shall be subjected to the following tests.

- An impact test at -50°C with average value of not less than 60J (min 42J) for parent metal and 40J (min 28J) for weld material and HAZ. (For components to be site welded the metallurgy of the base material shall ensure that require HAZ results can be met).
- A corrosion test to ASTM G48 at 25°C for 24 hours with an acceptance criteria of no visual pitting at 20x and weight loss of less than 4 g/m2.
- Micro test at 400x to ensure no grain boundary carbides or precipitates.
- Ferrite content in accordance with ASTM E562 with acceptance ferrite count in the range 30%-60%.
- Hardness testing with acceptable hardness range of 14 to 28 HRC.

The used of duplex stainless steel is limited to a maximum temperature of 100°C due to Chloride Stress Corrosion Cracking tendency. External painting is required if temperature exceeds the maximum requirements.

4.0 MATERIAL CERTIFICATION AND IDENTIFICATION

- The manufacturer shall provide certification to verify that the materials of construction meet the requirements of the material specifications.
- The different types of certificate which shall be used are distinguished as follows:

Type 2.2 (EN 10204 : 2004 type 2.2)

Document in which the manufacturer declares that the products supplied are in compliance with the requirements of the order and in which he supplies test results based on non specific inspection test by the manufacturer.

Type 3.1 (EN 10204 : 2004 type 3.1)

Document issued by the manufacturer in which he declares that the product supplied are in compliance with the requirements of the order and in which he supplied test results. The test unit and the test to be carried out are defined by the product specification, other official regulation and corresponding rules and/or the order. The document is validated by the manufacturer's authorized inspection representative, independent of the manufacturing department.

Quality assurance system of manufacturer certified by a competent body

Type 3.2 (EN 10204 : 2004 type 3.2)

Document prepared by both the manufacturer's authorized inspection representative, independent of the manufacturing department and either the purchaser's authorized inspection representative or the inspector designated by the official regulations and in which they declare that the products supplied are in compliance with the requirements of the order and in which test are results are supplied.

It shall be permissible for the manufacturer to transfer on to the inspection certificate 3.2 relevant test results obtained by specific inspection on primary or incoming products he uses, provided that the manufacturer operates traceability procedures and can provide the corresponding inspection documents required.

- All certificates shall contain the following information:

  a) name of manufacturer.

  b) purchase order number and date.

  c) manufacturer's order number.

  d) identification number of certificate and its date of issue.

  e) material specifications.

  f) dimensions.

  g) material charge number, batch number or heat-lot number

  h) mechanical properties recorded from test results.

  i) chemical composition recorded from chemical analysis.

  j) NDT methods and results, where applicable.

  k) heat treatment procedures and records, where applicable.

All Type 3.2 certificates shall contain the following additional information:

  l) name of independent inspector who has witnessed the tests

  m) the independent inspector's identification symbol.

- As a minimum, materials certificates in accordance with Type 2.2 are required for carbon steel pressure-containing parts in non-hydrocarbon services with an operating temperature above 0°C and for diaphragms, bearing housings, main bolts and nuts, etc. not in contact with hydrocarbon.

- As a minimum, material certificates in accordance with Type 3.1 are required for carbon steel pressure-containing parts in hydrocarbon services with an operating temperature above 0 °C and for low alloy, high alloy, nickel alloy, steel piping, fittings, valves, instruments, ,rotor shafts, impellers, shaft sleeves, discs and blading, for stationary blading and nozzle rings (i.e. components on hot gas path of gas turbine), and for the main bolts and nuts in contact with hydrocarbon services.

- Material certificates in accordance with Type 3.2 are required for pressure-containing parts of low and high alloy steels (martensitic steels, ferrite and austenitic stainless steel), nickel alloy (copper-nickel, Monel, Inconel, Incoloy, nickel aluminium

bronze, etc.) and titanium and for carbon steel pressure containing parts in hydrocarbon services with an operating temperature of 0°C and below.

- Positive material identification (PMI) is required. PMI which need only be applied once to a particular component or weld shall be carried out during the final stages of manufacture, in order to confirm the materials of construction are as specified. It is not the intent of the PMI to provide a confirmation of traceability from source to final inspection.

The CONTRACTOR/Vendor shall develop the PMI procedures to verify the chemical composition of all alloy materials, except carbon steel. A PMI test report shall be produced which shall include a PMI location plan to correlate the composition of the alloy with the location/ item from which the test was taken. Approval of the PMI procedures and programmed shall be obtained from the COMPANY/Purchaser prior to commencing manufacture. Instruments or methods used shall of the type that will provide quantitative, recordable, elemental composition results for positive identification of the alloy elements presents. Most PMI instrument allows the operator to key in the test identification and provides a print out report.

PMI shall be developed base on API 578

PMI shall be applied in accordance with the following categories:

Category 1 – all system /components in hydrocarbon service shall be subject to full PMI.

Category 2 – all systems/ components in utility service shall be subject to random PMI. This shall include 1 off test of each component of each alloy/ type. Components to be tested shall be at the discretion of the IVP / COMPANY.

Categories 2 are subject to the source being proven, meaning the Vendor has experience of the satisfactory supply of the component parts. Should the source be unproven then category 1 shall apply in all cases.

The following items shall require PMI:

a) Pressure containing welds.

b) Pressure containing components of piping.

c) Other pressure containing components, including thermowells, instrument manifolds and gaskets, etc.

d) Internal cladding/ lining/ and weld overlay.

e) Plate materials and structural sections.

f) Pressure containing machinery casing such as pumps and compressors.

g) Pressure containing instrument housings.

h) Valves bodies, flanges, bonnets and bolts.

i) Stud bolts and nuts.

In the event any one or more items are found to be other than the specification then all items will be subject to full PMI at the Vendor's cost.

- Marking is required for all components parts certified under material certificates Type 3.1 and Type 3.2 and those requiring PMI.

Parts with wall thickness above 5 mm, except items made of stainless steel or nickel alloys, shall be legibly marked by low pressure hard- die stamping on to a painted background, and at a point clearly visible later.

Items made of stainless steel or nickel alloys and parts with wall thickness below 5mm shall be marked by stencil with a water insoluble ink without metallic pigments, sulphur, sulphides, or chlorides which could harmfully affect the material.

- The stamping/ marking shall, where applicable, include the following:

a) manufacturer's symbol.

b) material and product identification.

c) charge or batch number.

d) heat treatment chart or furnace charge reference number, where applicable.

e) heat treatment symbol or code, where applicable.

f) NDT symbol or code, where applicable.

g) size and schedule.

h) hydrostatic test pressure, where applicable.

5.0 PIPING CLASS NOMENCLATURE

A C 01

Sequence Number

01 - 05	Normal Condition
06 - 10	Sour Condition

Material Coding

C	Carbon Steel
L	Low Temperature CS
S	Austenitic SS
D	Duplex SS
G	GRE
P	C PVC
K	Copper Nickel
X	High Strength Carbon Steel

Rating Code

A-	150#
B-	300#
D-	600#
E-	900#
F-	1500#
G-	2500#
H-	API 10000

6.0 PIPING SERVICE INDEX

No.	Piping Class	Basic Material	Corr. Allow (mm)	Rating	Class Design Limit ASME B16.5		FLG Facing	Service	Process Media	Service Design Condition		Max. Test Press. (barg)	Max. Size Range (mm)	Remarks / Notes
					Press. (barg)	Temp. ^{0}C				Max. Press. (barg)	Temp. ^{0}C Min/Max			
1	AC01	Carbon Steel	3	150	19.6 19.2 17.7	-29 to 38 50 100	RF	Process Liquid	PL	19.6	-29/100	29.4	600	
								Closed Drain	DC					
								Fuel Gas	FG					
								Methanol	MT					
								Atmospheric Vent	VA					
								HP Flare	BH					
								Process Gas	PG					
								Vessel Trim	VT					
								Open Drain Hazardous	DH					
2	AC02	Carbon Steel	1.5	150	19.6 19.2 17.7	-29 to 38 50 100	RF	Nitrogen	NT	19.6	-29/100	29.4	300	
								Diesel Fuel	FD					
								Atmospheric Vent	VA					
								Vessel Trim	VT					
3	AS01	Stainless Steel 316/316L	0	150	19 18.4 16.2	-29 to 38 50 100	RF	Process Liquid	PL	19.0	-29/100	28.5	600	
								Process Gas	PG					
								LP Flare	BL					
								Closed Drain	DC					
								HP Flare	BH					
								Open Drain Non Hazardous	DN					
								Utility Air	AU					

No.	Piping Class	Basic Material	Corr. Allow (mm)	Rating	Class Design Limit ASME B16.5		FLG Facing	Service	Process Media	Service Design Condition		Max. Test Press. (barg)	Max. Size Range (mm)	Remarks / Notes
					Press. (barg)	Temp. ^{0}C				Max. Press. (barg)	Temp. ^{0}C Min/Max			
								Potable Water	WP					
								Process Water	PW					
								Fuel Gas	FG					
								Aviation Fuel	FA					
								Instrument Air	AI					
								Atmospheric Vent	VA					
								Corrosion Inhibitor	CI					
								Wax Inhibitor	CP					
								Demulsifier	CD					
								Vessel Trim	VT					
4	AG01	GRE	0	150	16	75	FF	Open Drain Hazardous	DH	16	0/65	24	600	
								Open Drain Non Hazardous	DN					
								Black Water	WB					
								Wash Water	WW					
								Grey Water	WG					
								Atmospheric Vent	VA					
								Process Water	PW					
								Sea Water	WS					
								Vessel Trim	VT					

No.	Piping Class	Basic Material	Corr. Allow (mm)	Rating	Class Design Limit ASME B16.5		FLG Facing	Service	Process Media	Service Design Condition		Max. Test Press. (barg)	Max. Size Range (mm)	Remarks / Notes
					Press. (barg)	Temp. ^{0}C				Max. Press. (barg)	Temp. ^{0}C Min/Max			
5	AK01	Cu Ni	0	150	20 18.98	38 65	FF	Sea Water Fire Water	WS FW	17	0/65	25.50	300	
6	AP01	C-PVC	0	150	17.52 12.55	50 65	FF	Hypochlorite Atmospheric Vent	CH VA	12	0/65	18.00	100	
7	AD01	Duplex SS	0	150	20 19.5 17.7	0 to 38 50 100	RF	Produced Water	PW	10	0/80	15	600	
8	BC01	Carbon Steel	3	300	51.1 50.1 46.6	0 to 38 50 100	RF	Process Mixed Flow Process Gas Process Liquid Closed Drain Glycol Process Water Fuel Gas Vessel Trim	P PG PL DC GL PW FG VT	51.1	-29/100	76.65	600	

No.	Piping Class	Basic Material	Corr. Allow (mm)	Rating	Class Design Limit ASME B16.5		FLG Facing	Service	Process Media	Service Design Condition		Max. Test Press. (barg)	Max. Size Range (mm)	Remarks / Notes
					Press. (barg)	Temp. ^{0}C				Max. Press. (barg)	Temp. ^{0}C Min/Max			
9	BS01	Stainless Steel 316/316L	0	300	49.6 48.1 42.2	-29 to 38 50 100	RF	Process Mixed Flow	P	49.6	-29/100	74.4	600	
								Process Liquid	PL					
								Closed Drain	DC					
								Process Gas	PG					
								Process Water	PW					
								Wax Inhibitor	CP					
								Corrosion Inhibitor	CI					
								Demulsifier	CD					
								Vessel Trim	VT					
10	BX01	Carbon Steel High Strength	3	300	51.1 50.1 46.6	0 to 38 50 100	RF	Process Mixed Flow	P	51.1	-29/100	76.65	400	
11	BD01	Duplex SS	0	300	51.7 51.7 50.7 45.9	-29 to 38 50 100 150	RF	Fuel Gas	FG	45	0/115	67.5	600	
								Process Liquid	PL		-20/115			

No.	Piping Class	Basic Material	Corr. Allow (mm)	Rating	Class Design Limit ASME B16.5		FLG Facing	Service	Process Media	Service Design Condition		Max. Test Press. (barg)	Max. Size Range (mm)	Remarks / Notes
					Press. (barg)	Temp. ^{0}C				Max. Press. (barg)	Temp. ^{0}C Min/Max			
12	DC01	Carbon Steel	3	600	102.1 100.2 93.2	-29 to 38 50 100	RF	Closed Drain Fuel Gas	DC FG	102.1	-29/100	153.15	600	
13	DS01	Stainless Steel 316/316L	0	600	99.3 96.2 84.4	-29 to 38 50 100	RF	Process Mixed Flow Process Liquid Process Gas Closed Drain HP Flare Process Water Vessel Trim	P PL PG DC BH PW VT	99.3	-29/100	148.95	600	
14	FC01	Carbon Steel	3	1500	255.3 250.6 233.0	-29 to 38 50 100	RTJ	Process Mixed Flow Process Liquid Vessel Trim	P PL VT	255.3	-29/100	382.95	350	
15	FX01	Carbon Steel High Strength	3	1500	255.3 250.6 233.0	-29 to 38 50 100	RTJ	Process Mixed Flow	P	255.3	-29/100	382.95	650	

No.	Piping Class	Basic Material	Corr. Allow (mm)	Rating	Class Design Limit ASME B16.5		FLG Facing	Service	Process Media	Service Design Condition		Max. Test Press. (barg)	Max. Size Range (mm)	Remarks / Notes
					Press. (barg)	Temp. ^{0}C				Max. Press. (barg)	Temp. ^{0}C Min/Max			
16	HC01	Carbon Steel	3	10000	689 677 652 640	-29 to 38 65 93 121	RTJ	HP Flare Closed Drain	BH DC	405	-29/100	607.5	100	API 6A
17	HC02	Carbon Steel	1.5	10000	689 677 652 640	-29 to 38 65 93 121	RTJ	Methanol	MT	440	-29/100	607.5	100	API 6A
18	HS01	Stainless Steel	0	10000	689 677 652 640	-29 to 38 65 93 121	RTJ	Process Mixed Flow Closed Drain Wax Inhibitor	P DC CP	405	-29/100	607.5	150	API 6A

7.0 APPENDICIES

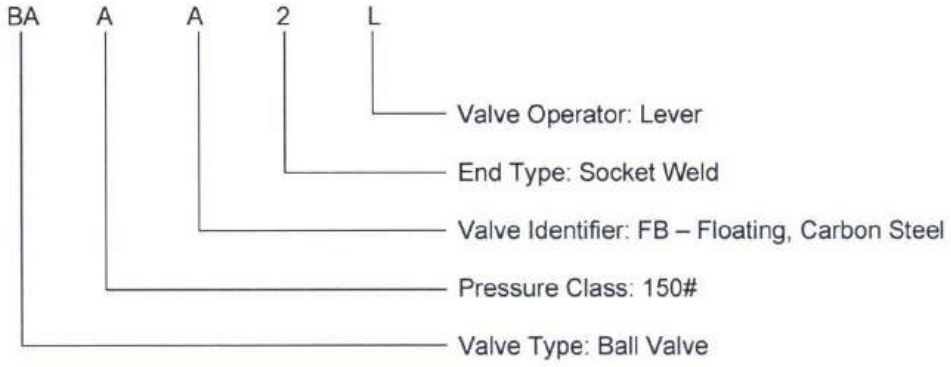
7.1 APPENDIX 1 – VALVE NUMBER CODING SYSTEM:

Valve Type	BA	Ball Valve
	BU	Butterfly valve
	CH	Check Valve
	GA	Gate Valve
	GL	Globe Valve
	DB	Double Block and Bleed Valve
	SB	Single Block and Bleed Valve
	NV	Needle Valve
	MV	Monoflange Valve
Pressure Class	A	150 ASME
	B	300 ASME
	D	600 ASME
	C	800 API 602, BS EN ISO 17292/ 15761
	E	900 ASME
	F	1500 ASME
	H	10000 API
End Type	1	Threaded
	2	Socket weld (SW)
	3	FF Flange
	4	RF Flange
	5	RTJ Flange
	6	SW x Screw
	7	Brazed
	8	Butt Weld
	9	FF Flange x Screw
	A	RF Flange x Screw
	B	RTJ Flange x Screw
Valve Operator	G	Gear box
	H	Hand wheel
	L	Lever
	N	None (for check valve)
	T	T-bar
Valve Identifier	A	FB – Floating, CS
Ball Valve	B	FB – Trunnion mounted, CS
	C	RB – Floating, CS
	D	RB – Trunnion mounted, CS
	E	FB – Floating, SS

	F	FB – Trunnion mounted, SS
	G	RB – Floating, SS
	H	RB – Trunnion mounted, SS
	I	FB – Floating, Bronze
	J	FB – Trunnion mounted, Bronze
	K	RB – Floating, Bronze
	L	RB – Trunnion mounted, Bronze
	M	FB – Floating, C-PVC
	N	RB – Floating, C-PVC
	O	FB – Floating, LTCS
	P	FB – Trunnion mounted, LTCS
	Q	RB – Floating, LTCS
	R	RB – Trunnion mounted, LTCS
	S	FB – Floating, Duplex SS
	T	RB – Floating, Duplex SS
	U	FB – Trunnion mounted, Duplex SS
	V	RB – Trunnion mounted, Duplex SS
Check Valve	A	Piston – CS
	B	Swing – CS
	C	Wafer Solid Lug Type, Dual Plate – CS
	D	Flanged Type, Dual Plate - CS
	E	Piston – SS
	F	Swing – SS
	G	Wafer Solid Lug Type, Dual Plate – SS
	H	Flanged Type, Dual Plate - SS
	I	Piston – Bronze
	J	Wafer Solid Lug Type, Dual Plate – Bronze
	K	Swing – Bronze
	L	Swing – C-PVC
	M	Wafer – C-PVC
	N	Piston – Duplex SS
	O	Swing – Duplex SS
	P	Wafer Solid Lug Type, Dual Plate – Duplex SS
	Q	Flanged Type, Dual Plate – Duplex SS
Butterfly Valve	A	Wafer Solid Lug Type – CS
	B	Wafer Solid Lug Type – Bronze
	C	Wafer Solid Lug Type – C-PVC
	D	Wafer Solid Lug Type – SS
Gate Valve	A	Wedge – CS
	B	Wedge – Bronze
	C	Wedge – SS
	D	Wedge – C-PVC
	E	Expanding - SS
	F	Expanding – Duplex SS
	G	Wedge – Duplex SS

Globe Valve	A	Inline – CS
	B	Inline – Bronze
	C	Inline – SS
	D	Inline – C-PVC
	E	Inline – Duplex SS
Single block & Bleed Valve	A	FB – CS
	B	FB – SS
	C	FB – Duplex SS
Double block & Bleed Valve	A	FB – CS
	B	FB – SS
	C	FB – Duplex SS
Monoflange Valve	A	Single Block & Bleed – SS
	B	Double Block & Bleed – SS
	C	Double Block & Bleed – Duplex SS
Needle Valve	A	Inside Screw

Example:



7.2 APPENDIX 2 – PIPING MATERIAL SPECIFICATION/ CLASSES:

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.3	PROCESS LIQUID, PROCESS GAS, CLOSE DRAIN, FUEL GAS, ATMOSPHERIC VENT, METHANOL, HP FLARE, VESSEL TRIM, OPEN HAZARDOUS	CARBON STEEL	ASME 150#	0.125" (3 mm)	AC01

PIPE — ASME B36.10M

SIZE	THK. & MATL
0.5" - 0.75"	SCH 160 A106 GR.B SMLS PE
1" - 1.5"	SCH 80 A106 GR.B SMLS PE
2" - 3"	SCH 80 A106 GR.B SMLS BE
4" - 6"	SCH 40 A106 GR.B SMLS BE
8" - 16"	SCH 20 A106 GR.B SMLS BE
18" - 24"	SCH 20 API 5L GR.B

FITTINGS — ASME B16.9, MSS SP-97

SW ≤ 1.5" ASME B16.11; MSS SP-97

6000# SIZE ≤0.75" ; 3000# SIZE ≥1" ASTM A105N

ELBOW	SOCKOLET
TEE	HEX. HEAD -
REDUCER	BUSHING
CAP	(0.5" - 0.75")
COUPLING	
PLUG (SOLID)	
LATROLET	
(MSS-SP 97)	

PE: SCH 160

NIPPLE 75 mm LONG - A106 GR B

SWAGE NIPPLE A106 Gr.B (MSS SP-95) - THICKNESS SAME AS PIPE

6

SIZE	BUTT WELDING FITTINGS ASTM A234 GR WPB, SMLS ASME B16.9
2" - 16"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP, WELDOLET, REDUCING TEE)

SIZE	BUTT WELDING FITTINGS ASTM A234 GR WPBW, ASME B16.9
18" - 24"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP)

VALVES — ASME B16.34, ASME B16.10, API 602, API 600, API 594, API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
≤ 1.5"	800# / 3000 Psig SW, HANDWHEEL (Note 7)	BODY: A105N TRIM: AISI 410 + STELLITE	GACA2H
BALL			
0.5" - 1.5"	800# / 3000 Psig SW, LEVER OP., FLOATING	BODY: A105N BALL/ STEM: 316SS SEATS: RPTFE	BACA2L
0.5" - 1.5"	800# / 3000 Psig SWxNPTF, LEVER OP., FLOATING		BACA6L
0.5" - 4"	150# RF, FLGD, LEVER OP., FLOATING	BODY: ASTM A216-WCB/ WCC, A105N BALL/ STEM: 316SS SEATS: RPTFE	BAAA4L BAAC4L
6" - 24"	150# RF, FLGD, GEAR OP., TRUNNION MOUNTED		BAAB4G BAAD4G
GLOBE			
0.5" - 6"	150# RF, FLGD, HANDWHEEL	BODY: ASTM A216-WCB/ WCC, A105N TRIM: AISI 410 + STELLITE	GLAA4H
8" - 16"	150# RF, FLGD, GEAR OPRATED		GLAA4G
CHECK			
≤ 1.5"	150# RF, FLGD, PISTON TYPE	BODY: ASTM A216-WCB/ WCC, A105N TRIM: AISI 410	CHAA4N
2" - 24"	150# RF, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: ASTM A216-WCB/ WCC, A105N PLATE: ASTM A217-CA15 SEATS: ASTM A105N + STELLITE	CHAC4N
MONOFLANGE VALVE			
≤ 3"	150# RF, FLGDx 1/2" NPTF SINGLE BLOCK AND BLEED	BODY: ASTM A182 F316/ 316L	MVAAAT
BUTTERFLY VALVE			
1" - 6"	150# RF, BUTTERFLY VALVE WAFER SOLID LUG TYPE, LEVER OP.	BODY: ASTM A216-WCB/ A105N DISC: 316SS SEAT: RPTFE	BJAA4L
8" - 24"	150# RF, BUTTERFLY VALVE WAFER SOLID LUG TYPE, GEAR OP.		BJAA4G
SINGLE BLOCK & BLEED VALVE			
≤ 2"	SINGLE BLOCK AND BLEED, 150# RF, LEVER OP.	BODY: ASTM A105N TRIM: SS316	SBAA4L
DOUBLE BLOCK & BLEED VALVE			
≤ 2"	DOUBLE BLOCK AND BLEED, 150# RF, LEVER OP.	BODY: ASTM A105N TRIM: SS316	DBAA4L

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
	AS PER ASME B16.5, ASTM A105N	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON
	BORE AND THK TO MATCH PIPE	COATED/ HEX. NUTS ASTM A194 GR.2H
0.5" - 1.5"	150# ASME RF SW	FLUOROCARBON COATED
		GASKET - SPIRAL WOUND, RF,150#, 4.5MM THK,
2" - 24"	150# ASME RF WN	AISI 316, GRAPHITE FILLED, CS OUTER RING &
		SS INNER RING, ASME B16.20
0.5" - 24"	150# ASME RF BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 10"	SPECTACLE BLIND, 150# RF ASME B16.48, ASTM A516 GR.70
12" - 24"	SPADE/ SPACER, 150# RF ASME B16.48, ASTM A516 GR.70

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24
0.5	TW															
0.75	RW	TW														
1	RW	RW	TW													
1.5	S,N	S,N	RW	TW												
2	S,N	S,N	RT	RT	T											
3	S,N	S,N	S,N	RT	RT	T										
4	S,N	S,N	S,N	S,N	RT	RT	T									
6	S,N	S,N	S,N	S,N	W	RT	RT	T								
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T							
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T						
12	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T					
14	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T				
16	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	RT	T			
18	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	T		
20	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	S,N	S,N	S,N	S,N	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24

6

LEGENDS

- **S** SOCKOLET
- **W** WELDOLET
- **T** EQUAL TEE BEVEL
- **RT** REDUCING TEE BEVEL
- **N** NIPPLEOLET FLANGE
- **TW** EQUAL TEE SOCKET END
- **RW** REDUCING TEE SOCKET END

BRANCH SIZES (INCHES)

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	285	-29 TO 38	19,65
122	278.47	50	19,2
212	256.72	100	17,7

NOTES:

1. Design limits are to flange rating ASME B16.5 MATERIAL GROUP 1.1
2. Welding neck flange to match wall thickness of pipe or fitting it is attached to.
3. Stud bolts and nuts shall be fluorocarbon coated blue colour
4. The use of reduced bore ball valve is preferred, use full bore ball valve only when necessary for process/ operating requirements
5. Piston check valve (0.5" - 1.5") for horizontal mounting only.
6. All threaded joint shall be NPT to ASME B1.20.1
7. Gate valve to be used for vent or drain only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.3	NITROGEN, DIESEL FUEL, ATMOSPHERIC VENT, VESSEL TRIM	CARBON STEEL	ASME 150#	0.0625" (1.5 mm)	AC02

PIPE
ASME B36.10M

SIZE	THK. & MATL
0.5" - 0.75"	SCH 160 A106
1" - 1.5"	GR.B SMLS PE SCH 80 A106 GR.B SMLS PE
2" - 3"	SCH 80 A106 GR.B SMLS BE
4"	SCH 30 A106 GR.B SMLS BE
6" - 12"	SCH 10 A106 GR.B SMLS BE

FITTINGS
ASME B16.9, ASME B16.11, MSS SP-97

SW ≤ 1.5" ASME B16.11		PE
6000# SIZE ≤0.75" ; 3000# SIZE ≥1" ASTM A105N		SCH 160
ELBOW	SOCKOLET	NIPPLE 75 mm LONG - A106 GR B
TEE	HEX. HEAD - BUSHING	SWAGE NIPPLE A106 Gr.B
REDUCER	(0.5" - 0.75")	(MSS SP-95) - THICKNESS SAME AS PIPE
CAP		
COUPLING		
PLUG (SOLID)		

SIZE	BUTT WELDING FITTINGS ASTM A234 GR WPB, SMLS ASME B16.9
2" - 12"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP, WELDOLET)

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
	AS PER ASME B16.5, ASTM A105N	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON
	BORE AND THK TO MATCH PIPE	COATED/ HEX. NUTS ASTM A194 GR.2H
0.5" - 1.5"	150# ASME RF SW	FLUOROCARBON COATED
		GASKET - SPIRAL WOUND, RF,150#, 4.5MM THK
2" - 12"	150# ASME RF WN	AISI 316, GRAPHITE FILLED, CS OUTER RING &
		SS INNER RING, ASME B16.20
0.5" - 12"	150# ASME RF BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 10"	SPECTACLE BLIND, 150# RF
	ASME B16.48, ASTM A516 GR 70
12"	SPADE/ SPACER, 150# RF
	ASME B16.48, ASTM A516 GR 70

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)	BRANCH SIZES (INCHES)										
0.5	TW										
0.75	RW	TW									
1	RW	RW	TW								
1.5	S,N	S,N	RW	TW							
2	S,N	S,N	RT	RT	T						
3	S,N	S,N	S,N	RT	RT	T					
4	S,N	S,N	S,N	S,N	RT	RT	T				
6	S,N	S,N	S,N	S,N	W	RT	RT	T			
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T		
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T	
12	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12

LEGENDS

- S SOCKOLET
- W WELDOLET
- T EQUAL TEE BEVEL
- RT REDUCING TEE BEVEL
- N NIPPLEOLET FLANGE
- TW EQUAL TEE SOCKET END
- RW REDUCING TEE SOCKET END

VALVES
ASME B16.34, ASME B16.10, API 602, API 600, API 594, API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
≤ 1.5"	800# / 3000 Psig SW, HANDWHEEL (Note 7)	BODY: A105N TRIM: AISI 410 + STELLITE	GACA2H
BALL			
0.5" - 1.5"	800# / 3000 Psig SW, LEVER OP. , FLOATING	BODY: A105N BALL/ STEM: 316SS SEATS: RPTFE	BACA2L
0.5" - 1.5"	800# / 3000 Psig SWxNPTF, LEVER OP. , FLOATING		BACA6L
0.5" - 4"	150# RF, FLGD, LEVER OP. , FLOATING	BODY: ASTM A216-WCB/ WCC, A105N BALL/ STEM: 316SS SEATS: RPTFE	BAAA4L BAAC4L
6 - 12"	150# RF, FLGD, GEAR OP. , TRUNNION MOUNTED		BAAB4G BAAD4G
GLOBE			
0.5" - 6"	150# RF, FLGD, HANDWHEEL	BODY: ASTM A216-WCB/ WCC, A105N TRIM: AISI 410 + STELLITE	GLAA4H
8" - 12"	150# RF, FLGD, GEAR OPERATED		GLAA4G
CHECK			
≤ 1.5"	150# PISTON TYPE, RF, FLGD	BODY: ASTM A216-WCB/ WCC, A105N TRIM: AISI 410	CHAA4N
2" - 12"	150# RF, FLGD, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: ASTM A216-WCB/ WCC, A105N PLATE: ASTM A217-CA15 SEATS: ASTM A105N + STELLITE	CHAC4N
MONOFLANGE VALVE			
0.5" - 3"	150# RF, FLGDx 1/2" NPTF SINGLE BLOCK AND BLEED	BODY: ASTM A182 F316/ 316L	MVAAAT
SINGLE BLOCK & BLEED VALVE			
≤ 2"	SINGLE BLOCK AND BLEED, 150# RF, LEVER OP.	BODY: ASTM A105N TRIM: SS316	SBAA4L
DOUBLE BLOCK & BLEED VALVE			
≤ 2"	DOUBLE BLOCK AND BLEED, 150# RF, LEVER OP.	BODY: ASTM A105N TRIM: SS316	DBAA4L

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	285	-29 TO 38	19.65
122	278.47	50	19,2
212	256.72	100	17,7

NOTES:

1. Design limits are to flange rating ASME B16.5 MATERIAL GROUP 1.1
2. Welding neck flange to match wall thickness of pipe or fitting it is attached to
3. Stud bolts and nuts shall be fluorocarbon coated blue colour
4. The use of reduced bore ball valve is preferred, use full bore ball valve only when necessary for process/ operating requirements
5. Piston check valve (0.5" - 1.5") for horizontal mounting only
6. All threaded joint shall be NPT to ASME B1.20.1
7. Gate valve to be used for vent or drain only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	5

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.3	PROCESS LIQUID, PROCESS GAS, CORROSION INHIBITOR, POTABLE WATER, UTILITY AIR, INSTRUMENT AIR, AVIATION FUEL, HP FLARE, OPEN DRAIN NON HAZARDOUS, LP FLARE, CLOSED DRAIN, ATMOSPHERIC VENT, FUEL GAS, WAX INHIBITOR, PROCESS WATER, DEMULSIFIER, VESSEL TRIM	STAINLESS STEEL	ASME 150#	NIL	AS01

PIPE — ASME B36.19M

SIZE	THK. & MATL
0.5" - 1.5"	SCH 80S ASTM A312-TP316/316L, PE
2" - 3"	SCH 40S ASTM A312-TP316/316L, BE
4" - 6"	SCH 10S ASTM A312-TP316/316L, BE
8" - 24"	SCH 10S ASTM A358-TP316/316L-1 (WELDED)

FITTINGS — ASME B16.9, ASME B16.11, MSS SP-97

SW ≤ 1.5" ASME B16.11		PE
3000# A182-F316/316L		SCH 80S
ELBOW	SOCKOLET	NIPPLE 75 mm LONG - A182-F316/316L
TEE	HEX. HEAD - BUSHING	SWAGE NIPPLE A182-F316/ 316L (MSS SP-95) - THICKNESS SAME AS PIPE
REDUCER	(0.5" - 0.75")	
CAP (SW & THRD)		
COUPLING		
PLUG (SOLID)		

SIZE	BUTT WELDING FITTINGS ASTM A403-WP316/316L, SMLS ASME B16.9
2" - 6"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

SIZE	BUTT WELDING FITTINGS ASTM A403-WP-WX316/316L ASME B16.9
8" - 24"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
0.5" - 1.5"	AS PER ASME B16.5, ASTM A182-F316/ 316L BORE AND THK TO MATCH PIPE 150# ASME RF SW	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON COATED/ HEX. NUTS ASTM A194 GR.2H FLUOROCARBON COATED. GASKET - SPIRAL WOUND, RF,150#, 4.5MM THK AISI 316, GRAPHITE FILLED, SS OUTER RING & SS INNER RING, ASME B16.20
2" - 24"	150# ASME RF WN	
0.5" - 24"	150# ASME RF BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 10"	SPECTACLE BLIND, 150# RF, ASME B16.48, ASTM A240-TP316/ 316L
12" - 24"	SPADE/ SPACER, 150# RF, ASME B16.48, ASTM A240-TP316/ 316L

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24
0.5	TW															
0.75	RW	TW														
1	RW	RW	TW													
1.5	S,N	S,N	RW	TW												
2	S,N	S,N	RT	RT	T											
3	S,N	S,N	S,N	RT	RT	T										
4	S,N	S,N	S,N	S,N	RT	RT	T									
6	S,N	S,N	S,N	S,N	S,N	W	RT	RT	T							
8	S,N	S,N	S,N	S,N	S,N	W	W	RT	RT	T						
10	S,N	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T					
12	S,N	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T				
14	S,N	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T			
16	S,N	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	RT	T		
18	S,N	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	T	
20	S,N	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	RT	T
24	S,N	S,N	S,N	S,N	S,N	W	W	W	W	W	RT	RT	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24

BRANCH SIZES (INCHES)

LEGENDS

- S SOCKOLET
- W WELDOLET
- T EQUAL TEE BEVEL
- RT REDUCING TEE BEVEL
- N NIPPLEOLET FLANGE
- TW EQUAL TEE SOCKET END
- RW REDUCING TEE SOCKET END

VALVES — ASME B16.34, ASME B16.10, API 602, API 600, API 594, API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
≤ 1.5"	800# SW, HANDWHEEL (Note 9)	BODY: A182-F316/316L TRIM: AISI 316/316L + STELLITE	GACC2H
BALL			
0.5" - 1.5"	800# / 3000 Psig SW, LEVER OP., FLOATING	BODY: A182-F316/316L, A351 CF8M BALL/ STEM: 316/316LSS SEATS: RPTFE	BACE2L
0.5" - 1.5"	800# / 3000 Psig SWxNPTF, LEVER OP., FLOATING		BACE6L
0.5" - 4"	150# RF, FLGD, LEVER OP., FLOATING	BODY: A182-F316/316L, A351 CF8M BALL/ STEM: 316/316LSS SEATS: RPTFE	BAAE4L BAAG4L
6" - 24"	150# RF, FLGD, GEAR OP., TRUNNION MOUNTED		BAAF4G BAAH4G
GLOBE			
0.5" - 6"	150# RF, FLGD, HANDWHEEL	BODY: A182-F316/316L, A351 CF8M TRIM: AISI 316/316L + STELLITE	GLAC4H
8" - 16"	150# RF, FLGD, GEAR OPERATED		GLAC4G
CHECK			
≤ 1.5"	150#, RF, FLGD PISTON TYPE	BODY: A182-F316/316L, A351 CF8M TRIM: AISI 316/316L	CHAE4N
2" - 24"	150# RF, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: A182-F316/316L TRIM: AISI 316/316L SEAT: AISI 316/316L + STELLITE	CHAG4N
MONOFLANGE VALVE			
≤ 3"	150# RF, FLGD x 1/2" NPTF SINGLE BLOCK AND BLEED	BODY: ASTM A182 F316 / 316L	MVAAAT
SINGLE BLOCK & BLEED VALVE			
≤ 2"	SINGLE BLOCK AND BLEED, 150# RF, LEVER OP.	BODY: ASTM A182 F316 / 316L TRIM: SS316	SBAB4L
DOUBLE BLOCK & BLEED VALVE			
≤ 2"	DOUBLE BLOCK AND BLEED, 150# RF, LEVER OP.	BODY: ASTM A182 F316 / 316L TRIM: SS316	DBAB4L

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	275.57	-29 TO 38	19
122	266.87	50	18,4
212	234.96	100	16,2

NOTES:

1. Design limits are to flange rating ASME B16.5 MATERIAL GROUP 2.2.
2. Maximum design temperature for piping exposed to marine environment is 60°C. External painting is required if temperature exceeds the maximum requirements due to corrosion cracking tendency.
3. The use of reduced ball valves is preferred; use full bore ball valves only when necessary for process/ operating requirements.
4. Piston type check valve (0.5" - 1.5") for horizontal mounting only.
5. Bore diameter of welding neck flanges shall match the inside diameter of pipe or pipe fitting it is attached to.
6. Pipe fabrication and inspection to insure 1.0 joint factor.
7. All threaded joints shall be NPT to ASME B1.20.1.
8. Stud bolts and nuts shall be fluorocarbon coated blue colour.
9. Gate valve to be used for vent or drain only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

MANUFACTURER' S STD.	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
	OPEN DRAIN HAZARDOUS, OPEN DRAIN NON HAZARDOUS, BLACK WATER, GREY WATER, WASH WATER, SEA WATER, PROCESS WATER, ATMOSPHERIC VENT, VESSEL TRIM	GLASS REINFORCED EPOXY (GRE)	16 BAR △6	NIL	AG01

PIPE
MANUFACTURER' S STD.

SIZE	DN (mm)	THK (mm)	MATL.
1"	25	3.5	ASTM D2996
1.5"	40	3.5	
2"	50	3.6	
3"	80	3.6	
4"	100	4.6	
6"	150	4.6	
8"	200	5.5	
10"	250	7	
12"	300	8.3	
14"	350	9	
16"	400	10.3	
18"	450	11.5	
20"	500	12.8	
24"	600	15.4	

FITTINGS
MANUFACTURER' S STD.

SIZE	SOCKET END FITTINGS △6 GRE, SMLS ASME
1" - 24"	ELB, TEE, CAP, 45 DEG LATERAL, RED. TEE, RED. CONC., RED ECC., SADDLE

VALVES
ASME B16.34, ASME B16.10, API 602, API 600, API 609, API 594, API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
1" - 3"	150# FF, FLGD, HANDWHEEL	BODY: ASTM B148 TRIM: ASTM B148	GAAB3H
BALL			
1" - 4"	150# FF FLGD, RED. BORE, LEVER OP., FLOATING	BODY: ASTM B148 BALL: ASTM B148 SEAT: PTFE	BAAI3L BAAK3L
6" - 24"	150# FF FLGD, RED. BORE, GEAR OP., TRUNNION MOUNTED		BAAL3G
GLOBE			
1 - 6"	150# FF, FLGD, HANDWHEEL	BODY: ASTM B148 TRIM: ASTM B148	GLAB3H
CHECK			
2" - 24"	150# FF, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: ASTM B148 BALL: ASTM B148 SEATS: BUNA-N	CHAJ3N
BUTTERFLY			
4" - 6"	150# FF, BUTTERFLY VALVE WAFER SOLID LUG TYPE LEVER OP.	BODY: ASTM B148 DISC: ASTM B148 SEAT: BUNA-N	BUAB3L
8" - 24"	150# FF, BUTTERFLY VALVE WAFER SOLID LUG TYPE, GEAR OP.	BODY: ASTM B148 DISC: ASTM B148 SEAT: BUNA-N	BUAB3G

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
	AS PER ASME B16.5, ASTM D4024	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON COATED/ HEX. NUTS ASTM A194 GR 2H FLUOROCARBON COATED WASHER BACK ASTM A307-B
1" - 1.5"	150# ASME, HEAVY DUTY FLANGE, FF	
2" - 24"	150# ASME, HEAVY DUTY FLANGE, FF △6	GASKET - PTFE REINFORCED WITH MINERAL FILLER 150# FF
1" - 24"	150# ASME, BLIND FLANGE, FF	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	BRANCH SIZES (INCHES)														
1	T														
1.5	RT	T													
2	RT	RT	T												
3	RT	RT	RT	T											
4	SA	RT	RT	RT	T										
6	SA	SA	RT	RT	RT	T									
8	SA	SA	SA	RT	RT	RT	T								
10	SA	SA	SA	SA	RT	RT	RT	T							
12	SA	SA	SA	SA	RT	RT	RT	RT	T						
14	SA	SA	SA	SA	SA	RT	RT	RT	RT	T					
16	SA	SA	SA	SA	SA	RT	RT	RT	RT	RT	T				
18	SA	SA	SA	SA	SA	SA	RT	RT	RT	RT	RT	T			
20	SA	SA	SA	SA	SA	SA	RT	RT	RT	RT	RT	RT	T		
24	SA	SA	SA	SA	SA	SA	SA	RT	RT	RT	RT	RT	RT	T	
NPS	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24	

LEGENDS

SA SADDLE
T TEE
RT REDUCING TEE
N NIPPLEOLET FLANGE

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
32	232.06	0	16
77	232.06	25	16
122	232.06	50	16
167	232.06	75	16

NOTES:

1. Thickness are indicative and may vary. Manufacturer shall submit the wall thickness calculations to verify selection. Wall thickness shall be confirmed during fabrication.
2. With the exception of valves, components from different manufacturers should not be used in the same system, due to different thermal expansion that causes different stresses. Connection to existing system shall be made using flanges.
3. End connection shall be spigot/ socket or butt strap.
4. Flanges to be used at valves, equipment and piping spec breaks only.
5. Flanges to be drilled in accordance with ASME B16.5 Class 150.
6. Flat face GRE flanges to be used with FF equipment only. However if the equipment flanges are RF connection, a steel backing ring behind the GRE flanges shall be used.
7. Bolting for Flat Face GRE flanges to be provided with flat washers.
8. Length of stud bolts shall be based on the thickest flange thickness and be confirmed by manufacturer during fabrication.
9. Stud bolts and nuts shall be fluorocarbon coated grey colour.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API 14E EEMUA STD.	SEA WATER, FIRE WATER	COPPER-NICKEL 90/10	ASME 150#	NIL	**AK01**

PIPE EEMUA 144

SIZE	DN (mm)	THK (mm	MATL.
0.5"	15	2.0	SEAMLESS ANNEALED COPPER ALLOY TUBE TO ASTM B468 C70600 OR EEMUA 144 C70600X 20 bar RATING
0.75"	20	2.0	
1"	25	2.5	
1.5"	40	2.5	
2"	50	2.5	
3"	80	2.5	
4"	100	3.0	
6"	150	3.5	
8"	200	4.5	
10"	250	5.5	
12"	300	7.0	

FITTINGS EEMUA 146

6 BRAZED ≤ 1.5" 90/10 Cu-Ni

FORGED, EEMUA 146, 90/10 Cu-Ni

ELBOW	UNION (INTEGRAL BRASS SEAT)
TEE	SOCKOLET
REDUCER	THREADOLET
CAP	
COUPLING	
PLUG (SOLID)	

SIZE	BUTT WELDING FITTINGS EEMUA 146, 90/10 Cu-Ni
2" - 12"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
	AS PER ASME B16.5 AND EEMUA 145	STUD BOLTS ASTM A193 GR.B7
	20 Bar RATING, 90/10 Cu-Ni	HEX. NUTS AS7M A194 GR.2H
		FLUOROCARBON COATED.
0.5" - 4"	150# ASME SOLID SLIP-ON FF	GASKET 2 mm THK FLAT RING FULL FACE NON
		GRAPHITE CNAF TO SUIT FLANGES AS PER
6" - 12"	150# ASME WN FF	ASME B16.21
0.5" - 12"	150# ASME BLIND FLANGE FF	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 10"	SPECTACLE BLIND, 150# FF ASME B16.48, 90/10 Cu-Ni
12"	SPADE/ SPACER, 150# FF ASME B16.48, 90/10 Cu-Ni (6)

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	0.5	0.75	1	1.5	2	3	4	6	8	10	12
0.5	T										
0.75	RT	T									
1	RT	RT	T								
1.5	S,N	S,N	RT	T							
2	S,N	S,N	S,N	RT	T						
3	S,N	S,N	S,N	S,N	RT	T					
4	S,N	S,N	S,N	S,N	RT	RT	T				
6	S,N	S,N	S,N	S,N	W	RT	RT	T			
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T		
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T	
12	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12

6

LEGENDS

S SOCKOLET
W WELDOLET
T TEE
RT REDUCING TEE
N NIPPLEOLET FLANGE

BRANCH SIZES (INCHES)

VALVES
ASME B16.34, ASME B16.10, API 602, API 600, API 609, API 594, API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
1" - 3"	150# FF, FLGD, HANDWHEEL	BODY: ASTM B148 TRIM: ASTM B148	GAAB3H
BALL			
≤ 1.5"	800# / 3000 Psig NPTF, LEVER OP., FLOATING	BODY: ASTM B148 BALL: ASTM B148 SEAT: PTFE	BACI1L
0.5" - 4"	150# FF FLGD, LEVER OP., FLOATING		BAAI3L BAAK3L
6" - 12"	150# FF FLGD, GEAR OP., TRUNION MOUNTED		BAAJ3G BAAL3G
GLOBE			
1" - 6"	150# FF, FLGD, HANDWHEEL	BODY: ASTM B148 TRIM: ASTM B148	GLAB3H
CHECK			
2" - 12"	150# FF, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: ASTM B148 PLATES: ASTM B148 SEAT: BUNA-N	CHAJ3N
BUTTERFLY			
4" - 6"	150# FF, BUTTERFLY VALVE WAFER SOLID LUG TYPE, LEVER OP.	BODY: ASTM B148 DISC: ASTM B148 SEAT: BUNA-N	BUAB3L
8" - 12"	150# FF, BUTTERFLY VALVE WAFER SOLID LUG TYPE GEAR OP.		BUAB3G

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
32	290.08	0	20
77	290.08	25	20
100.4	290.08	38	20
122	285.72	50	19.7
149	275.28	65	18.98

NOTES:

1. Wall thickness was based in 20 bar rating for seemless 90/10 Cu-Ni tubes of EEMUA 144
2. Studbolts and nuts shall be fluorocarbon coated grey colour and provided with insulating washers and sleeves

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

MANUFACTURER' S STD.	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
	HYPOCHLORITE, ATMOSPHERIC VENT	C-PVC	ASME 150#	NIL	AP01

PIPE
MANUFACTURER' S STD.

SIZE	THK. & MATL
0.75" - 4"	SCH 80 SMSL PE, C-PVC (ASTM F441 OR EQUAL) (Note 1)

FITTINGS
MANUFACTURER' S STD.

SIZE	SOCKET END FITTINGS C-PVC (ASTM F439 OR EQUAL)
0.75" - 4"	COUPLING
	CAP
	ELBOW 45 DEG.
	ELBOW 90 DEG.
	EQUAL TEE
	REDUCING TEE
	REDUCER CONC.
	REDUCER ECC.

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
	AS PER ASME B16.5, ASTM D1784	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON
	BORE AND THK TO MATCH PIPE	COATED/ HEX. NUTS ASTM A194 GR.2H
0.75" - 4"	150# ASME FF SOCKET END	FLUOROCARBON COATED
		WASHER: A307-B
0.75" - 4"	150# ASME FF BLIND FLANGE	ELASTOMER GASKET, 1/8" THK. WITH SHORE "A"
		DUROMETER, FULL FACE

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)	BRANCH SIZES (INCHES)						
0.75	T						
1	RT	T					
1.5	RT	RT	T				
2	SA	SA	SA	T			
3	SA	SA	SA	RT	T		
4	SA	SA	SA	RT	RT	T	
NPS	0.75	1	1.5	2	3	4	

6

LEGENDS

SA SADDLE
RT REDUCING TEE
T TEE

VALVES
MANUFACTURER'S STD.

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
0.75"	800# SOCKET END, HANDWHEEL MANUF. STD	BODY: CPVC, ASTM D1784 TRIM: CPVC, ASTM D1784	GACD2H
1" - 2"	150# FF FLGD, HANDWHEEL MANUF. STD		GAAD3H
BALL			
0.5" - 0.75"	800# SOCKET END, LEVER OP., FLOATING, MANUF. STD	BODY: CPVC, ASTM D1784 TRIM: CPVC, ASTM D1784	BACM2L
1" - 2"	150# FF FLGD, LEVER OP., FLOATING, MANUF. STD		BAAM3L BAAN3L
GLOBE			
1" - 2"	150#, FF FLGD, HANDWHEEL, MANUF. STD	BODY: CPVC, ASTM D1784 TRIM: CPVC, ASTM D1784	GLAD3H
CHECK			
1" - 2"	150#, FF FLGD, PISTON TYPE	BODY: CPVC, ASTM D1784 TRIM: CPVC, ASTM D1784	CHAL3N

PRESSURE-TEMPERATURE RATING

TEMP. °F	PRESS, Psig	TEMP, °C	PRESS, Barg
32	399.87	0	27.57
77	399.87	25	27.57
122	254.11	50	17.52
149	182.02	65	12.55

NOTES:

1. Wall thickness/ schedule was based on Table X1.2 of ASTM F441/ F441M-09. Manufacturer to verify, and confirmed wall thickness during fabrication.
2. Materials shall conform to ASTM D1784 (CPVC Cell Classification 23447-B)
3. Stud bolts and nuts shall be fluorocarbon coated white colour.
4. Size DN100 (4 inch) to be used for atmospheric vent only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.3	PRODUCED WATER	DUPLEX STAINLESS STEEL	ASME 150#	NIL	AD01

PIPE
ASME B36.19M

SIZE	THK. & MATL
0.5" - 1.5"	SCH 80S, ASTM A790-UNS S31803 PE, SMLS
2" - 6"	SCH 10S ASTM A790-UNS S31803 BE, SMLS
8" - 24"	SCH 10S ASTM A928-UNS S31803 BE, WELDED

FITTINGS
ASME B16.9, ASME B16.11, MSS SP-97

SW ≤ 1.5" ASME B16.11		PE
3000# A182-F51 (UNS S31803)		SCH 80S
ELBOW	SOCKOLET	NIPPLE 75 mm LONG - A182-F51
TEE	HEX. HEAD -	SWAGE NIPPLE A182-F51
REDUCER	BUSHING	(MSS SP-95) - THICKNESS
CAP (SW & THRD)	(0.5" - 0.75")	SAME AS PIPE
COUPLING		
PLUG (SOLID)		

SIZE	BUTT WELDING FITTINGS ASTM A815-CL WP-S, UNS S31803 SMLS ASME B16.9
2" - 6"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

SIZE	BUTT WELDING FITTINGS ASTM A815-CL WP-WX, UNS S31803 ASME B16.9
8" - 24"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
	AS PER ASME B16.5, ASTM A182-F51 UNS S31803	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON COATED/ HEX. NUTS ASTM A194 GR.2H
	BORE AND THK TO MATCH PIPE	FLUOROCARBON COATED
0.5" - 1.5"	150# ASME RF SW	GASKET - SPIRAL WOUND, RF, 150#, 4.5MM THK
		AISI 316, GRAPHITE FILLED, SS OUTER RING &
2" - 24"	150# ASME RF WN	SS INNER RING, ASME B16.20
0.5" - 24"	150# ASME RF BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 10"	SPECTACLE BLIND, 150# RF, ASME B16.48, ASTM A240-UNS S31803
12" - 24"	SPADE/ SPACER, 150# RF, ASME B16.48, ASTM A240-UNS S31803

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24
0.5	TW															
0.75	RW	TW														
1	RW	RW	TW													
1.5	S,N	S,N	RW	TW												
2	S,N	S,N	RT	RT	T											
3	S,N	S,N	S,N	RT	RT	T										
4	S,N	S,N	S,N	S,N	RT	RT	T									
6	S,N	S,N	S,N	S,N	W	RT	RT	T								
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T							
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T						
12	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T					
14	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T				
16	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	RT	T			
18	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	T		
20	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	S,N	S,N	S,N	S,N	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24

BRANCH SIZES (INCHES)

LEGENDS

- **S** SOCKOLET
- **W** WELDOLET
- **T** EQUAL TEE BEVEL
- **RT** REDUCING TEE BEVEL
- **N** NIPPLEOLET FLANGE
- **TW** EQUAL TEE SOCKET END
- **RW** REDUCING TEE SOCKET END

VALVES
ASME B16.34, API 608, API 602, API 600, API 594

GATE

SIZE	DESCRIPTION	MATERIAL	CODE
≤ 1.5"	800# SW, HANDWHEEL (Note 9)	BODY: ASTM A182-F51 TRIM: UNS S31803	GACF2H

BALL

SIZE	DESCRIPTION	MATERIAL	CODE
0.5" - 1.5"	800# / 3000 Psig SW, LEVER OP., FLOATING	BODY: A182-F51/ A995-GR4A TRIM: UNS S31803	BACS2L
0.5" - 1.5"	800# / 3000 Psig SWxNPTF, LEVER OP., FLOATING	SEAT: RPTFE	BACS6L
0.5" - 4"	150# RF, FLGD, LEVER OP., FLOATING	BODY: A182-F51/ A995-GR4A TRIM: UNS S31803	BAAS4L BAAT4L
6" - 24"	150# RF, FLGD, GEAR OP., TRUNNION MOUNTED	SEAT: RPTFE	BAAU4G BAAV4G

GLOBE

SIZE	DESCRIPTION	MATERIAL	CODE
0.5" - 6"	150# RF, FLGD, HANDWHEEL	BODY: A182-F51/ A995-GR4A	GLAE4H
8"	150# RF, FLGD, GEAR OPERATED	TRIM: UNS S31803 SEAT: RPTFE	GLAE4G

CHECK

SIZE	DESCRIPTION	MATERIAL	CODE
≤ 1.5"	150#, RF, FLGD PISTON TYPE	BODY: A182-F51/ A995-GR4A TRIM: UNS S31803	CHAN4N
2" - 24"	150# RF, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: A182-F51/ A995-GR4A PLATE: UNS S31803 SEAT: UNS S31803	CHAP4N
12" - 24"	150# RF, DUAL PLATE, FLANGED TYPE		CHAQ4N

MONOFLANGE VALVE

SIZE	DESCRIPTION	MATERIAL	CODE
≤ 3"	150# RF, FLGD x 1/2" NPTF DOUBLE BLOCK AND BLEED	BODY: A182-F51	MVACAT

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
32	290.08	0	20
122	282.82	50	19.5
167	269.77	75	18.6
212	256.72	100	17.7

NOTES:

1. Design limits are to flange rating ASME B16.5 MATERIAL GROUP 2.8
2. Maximum design temperature for duplex stainless steel exposed to marine environment is 100°C. External painting is required if temperature exceeds this maximum requirements due to corrosion cracking tendency.
3. The use of reduced ball valves is preferred, use full bore ball valves only when necessary for process/ operating requirements.
4. Piston type check valve (0.5" - 1.5") for horizontal mounting only
5. Bore diameter of welding neck flanges shall match the inside diameter of pipe or pipe fitting it is attached to.
6. Pipe fabrication and inspection to insure 1.0 joint factor
7. All threaded joints shall be NPT to ASME B1.20.1
8. Stud bolts and nuts shall be fluorocarbon coated blue colour.
9. Gate valve to be used for vent or drain only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.3	PROCESS MIXED FLOW, PROCESS GAS, PROCESS LIQUID, HP FLARE, CLOSED DRAIN, GLYCOL, PROCESS WATER, FUEL GAS, VESSEL TRIM	CARBON STEEL	ASME 300#	0.125" (3 mm)	**BC01**

PIPE
ASME B36.10M

SIZE	THK. & MATL
0.5" - 0.75"	SCH 160 A106 GR.B SMLS PE
1" - 1.5"	SCH 80 A106 GR.B SMLS PE
2" - 3"	SCH 80 A106 GR.B SMLS BE
4" - 16"	SCH 40 A106 GR.B SMLS BE
18" - 24"	SCH 40 API 5L GR.B BE

FITTINGS
ASME B16.9, ASME B16.11, MSS SP-97

SW ≤ 1.5" ASME B16.11		PE
6000# SIZE ≤0.75" ; 3000# SIZE ≥1" ASTM A105N		SCH 160
ELBOW TEE REDUCER CAP COUPLING PLUG (SOLID)	SOCKOLET HEX. HEAD - BUSHING (0.5" - 0.75")	NIPPLE 75 mm LONG - A106 GR.B SWAGE NIPPLE A106 Gr.B (MSS SP-95) - THICKNESS SAME AS PIPE ⚠6

SIZE	BUTT WELDING FITTINGS ASTM A234 GR WPB, SMLS ASME B16.9
2" - 16"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

SIZE	BUTT WELDING FITTINGS ASTM A234 GR WPBW, ASME B16.9
18" - 24"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP)

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
	AS PER ASME B16.5, ASTM A105N	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON
	BORE AND THK TO MATCH PIPE	COATED/ HEX. NUTS ASTM A194 GR.2H
0.5" - 1.5"	300# ASME RF SW	FLUOROCARBON COATED
		GASKET - SPIRAL WOUND, RF,300#, 4.5MM THK
2" - 24"	300# ASME RF WN	AISI 316, GRAPHITE FILLED, CS OUTER RING &
		SS INNER RING, ASME B16.20
0.5" - 24"	300# ASME RF BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 6"	SPECTACLE BLIND, 300# RF ASME B16.48, ASTM A516 GR 70
8" - 24"	SPADE/ SPACER, 300# RF ASME B16.48, ASTM A516 GR 70

BRANCH REINFORCEMENT

HEADER SIZES (INCHES) \ BRANCH SIZES (INCHES)	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24
0.5	TW															
0.75	RW	TW														
1	RW	RW	TW													
1.5	S,N	S,N	RW	TW												
2	S,N	S,N	RT	RT	T											
3	S,N	S,N	S,N	RT	RT	T										
4	S,N	S,N	S,N	S,N	RT	RT	T									
6	S,N	S,N	S,N	S,N	W	RT	RT	T								
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T							
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T						
12	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T					
14	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T				
16	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	RT	T			
18	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	T		
20	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	S,N	S,N	S,N	S,N	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24

⚠6

LEGENDS

- S SOCKOLET
- W WELDOLET
- T EQUAL TEE BEVEL
- RT REDUCING TEE BEVEL
- N NIPPLEOLET FLANGE
- TW EQUAL TEE SOCKET END
- RW REDUCING TEE SOCKET END

VALVES
ASME B16.34, ASME B16.10, API 602, API 600, API 594, API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
0.5" - 1.5"	800# / 3000 Psig SW, HANDWHEEL (Note 7)	BODY: ASTM A216-WCB/ WCC, A105N TRIM: 316SS+STELLITE	GACA2H
BALL			
0.5" - 1.5"	800# / 3000 Psig SW, LEVER OP., FLOATING	BODY: A105N BALL/ STEM: 316SS SEATS: RPTFE	BACA2L
0.5" - 1.5"	800# / 3000 Psig SWxNPTF, LEVER OP., FLOATING		BACA6L
0.5" - 4"	300# RF, FLGD, LEVER OP., FLOATING	BODY: ASTM A216-WCB/ WCC, A105N BALL/ STEM: 316SS	BABA4L BABC4L
6" - 24"	300# RF, FLGD, GEAR OP., TRUNNION MOUNTED	SEATS: RPTFE	BABB4G BABD4G
GLOBE			
0.5" - 6"	LGD, HANDWHEEL	BODY: ASTM A216-WCB/ WCC, A105N	GLBA4H
8" - 16"	300# RF, FLGD, GEAR OPERATED	TRIM: 316SS + STELLITE SEATS: ASTM A105 + STELLITE	GLBA4G
CHECK			
≤ 1.5"	300# RF, FLGD, PISTON TYPE	BODY: ASTM A216-WCB/ WCC, A105N TRIM: 316SS	CHBA4N
2" - 10"	300# RF, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: ASTM A216-WCB/ WCC, A105N PLATE: 316SS	CHBC4N
12" - 24"	300# RF, FLGD, DUAL PLATE	SEAT: 316SS + STELLITE	CHBD4N
2" - 24"	300# RF, FLGD, SWING TYPE (NOTE 8)		CHBB4N
MONOFLANGE VALVE			
≤ 3"	300# RF, FLGDx 1/2" NPTF SINGLE BLOCK AND BLEED	BODY: ASTM A182 F316/ 316L	MVBAAT
SINGLE BLOCK & BLEED VALVE			
≤ 2"	SINGLE BLOCK AND BLEED, 300# RF, LEVER OP.	BODY: ASTM A105N TRIM: SS316	SBBA4L
DOUBLE BLOCK & BLEED VALVE			
≤ 2"	DOUBLE BLOCK AND BLEED, 300# RF, LEVER OP.	BODY: ASTM A105N TRIM: SS316	DBBA4L

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	741.14	-29 TO 38	51.1
122	725.64	50	50.1
212	675.88	100	46.6

NOTES:

1. Design limits are to flange rating per ASME B16.5 MATERIAL GROUP 1.1.
2. Welding neck neck flange to match wall thickness of pipe or fitting it is attached to.
3. Stud bolts and nuts shall be fluorocarbon coated blue colour
4. The use of reduced bore ball valves is preferred, used full bore ball valves only when necessary for process/operating requirements.
5. Piston type check valves (0.5" - 1.5") are for horizontal mounting only.
6. All threaded joints shall be NPT to ASME B1.20.1
7. Gate valve to be used for vent or drain only.
8. Check valve to be used for dissimilar type only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.3	PROCESS MIXED FLOW, PROCESS LIQUID, PROCESS GAS, CLOSED DRAIN, CORROSION INHIBITOR, PROCESS WATER, WAX INHIBITOR, DEMULSIFIER, VESSEL TRIM	STAINLESS STEEL	ASME 300#	NIL	**BS01**

PIPE
ASME B36.19M
ASME B36.10M

SIZE	THK. & MATL
0.5" - 1.5"	SCH. 80S ASTM A312-TP316/316L, PE
2" - 3"	SCH. 40S ASTM A312-TP316/316L, BE
4"	SCH. 10S ASTM A312-TP316/316L, BE
6"	SCH. 40S ASTM A312-TP316/316L, BE
8" - 10"	SCH. 40S ASTM A358-TP316/316L-1 (WELDED)
12" - 24"	SCH. 30 ASTM A358-TP316/316L-1 (WELDED)

FITTINGS
ASME B16.9, ASME B16.11, MSS SP-97

SW ≤ 1.5" ASME B16.11		PE
3000# A182-F316/316L		SCH. 80S
ELBOW	PLUG (SOLID)	NIPPLE 75 mm LONG -
TEE	SOCKOLET	A182-F316/316L
REDUCER	HEX. HEAD -	SWAGE NIPPLE A182-F316/
CAP (SW & THRD)	BUSHING	316L (MSS SP-95) - THICKNESS
COUPLING	(0.5" - 0.75")	SAME AS PIPE

SIZE	BUTT WELDING FITTINGS ASTM A403-WP316/316L, SMLS ASME B16.9
2" - 6"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

SIZE	BUTT WELDING FITTINGS ASTM A403-WP-WX316/316L, ASME B16.9
8" - 24"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP, WELDOLET)

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
	AS PER ASME B16.5, ASTM A182-F316/316L	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON
	BORE AND THK TO MATCH PIPE	COATED/ HEX. NUTS ASTM A194 GR.2H
0.5" - 1.5"	300# ASME RF SW	FLUOROCARBON COATED.
		GASKET - SPIRAL WOUND, RF,300#, 4.5MM THK
2" - 24"	300# ASME RF WN	AISI 316, GRAPHITE FILLED, SS OUTER RING &
		SS INNER RING, ASME B16.20
0.5" - 24"	300# ASME RF BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 6"	SPECTACLE BLIND, 300# RF, ASME B16.48, ASTM A240-TP316/ 316L
8" - 24"	SPADE/ SPACER, 300# RF, ASME B16.48, ASTM A240-TP316/ 316L

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24
0.5	TW															
0.75	RW	TW														
1	RW	RW	TW													
1.5	S,N	S,N	RW	TW												
2	S,N	S,N	RT	RT	T											
3	S,N	S,N	S,N	RT	RT	T										
4	S,N	S,N	S,N	S,N	RT	RT	T									
6	S,N	S,N	S,N	S,N	W	RT	RT	T								
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T							
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T						
12	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T					
14	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T				
16	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	RT	T			
18	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	T		
20	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	S,N	S,N	S,N	S,N	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24

BRANCH SIZES (INCHES)

LEGENDS
- S SOCKOLET
- W WELDOLET
- T EQUAL TEE BEVEL
- RT REDUCING TEE BEVEL
- N NIPPLEOLET FLANGE
- TW EQUAL TEE SOCKET END
- RW REDUCING TEE SOCKET END

VALVES
ASME B16.34, ASME B16.10, API 602, API 600, API 594, API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
0.5" - 1.5"	800# / 3000 Psig SW, HANDWHEEL	BODY: A182-F316/316L, A351 CF8M TRIM: AISI 316/316L + STELLITE	GACC2H
BALL			
0.5" - 1.5"	800# / 3000 Psig SW, LEVER OP., FLOATING	BODY: A182-F316/316L BALL/STEM: 316/316LSS SEATS: RPTFE	BACE2L
0.5" - 1.5"	800# / 3000 Psig SW/NPTF, LEVER OP., FLOATING		BACE8L
0.5" - 4"	300# RF, FLGD, LEVER OP., FLOATING	BODY: A182-F316/316L, A351 CF8M BALL/STEM: 316/316LSS SEATS: RPTFE	BABE4L BABG4L
6" - 24"	300# RF, FLGD, GEAR OP., TRUNNION MOUNTED		BABF4G BABH4G
GLOBE			
0.5" - 6"	300# RF, FLGD, HANDWHEEL	BODY: A182-F316/316L, A351 CF8M TRIM: AISI 316SS + STELLITE	GLBC4H
8"-16"	300# RF, FLGD, GEAR OPERATED		GLBC4G
CHECK			
≤ 1.5"	300# RF, FLGD PISTON TYPE	BODY: A182-F316/316L, A351 CF8M TRIM: AISI 316/316L	CHBE4N
2" - 10"	300# RF, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: A182-F316/316L, TRIM: AISI 316/316L SEAT: AISI 316/316L + STELLITE	CHBG4N
12" - 24"	300# RF, FLGD, DUAL PLATE		CHBH4N
2" - 24"	300# RF, FLGD, SWING TYPE (NOTE 10)		CHBF4N
MONOFLANGE VALVE			
≤ 3"	300# RF, FLGDx 1/2" NPTF SINGLE BLOCK AND BLEED	BODY: ASTM A182 F316/ 316L	MVBAAT
SINGLE BLOCK & BLEED VALVE			
≤ 2"	SINGLE BLOCK AND BLEED, 150# RF, LEVER OP.	BODY: ASTM A182 F316 / 316L TRIM: SS316	SBBB4L
DOUBLE BLOCK & BLEED VALVE			
≤ 2"	DOUBLE BLOCK AND BLEED, 150# RF, LEVER OP.	BODY: ASTM A182 F316 / 316L TRIM: SS316	DBBB4L

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	720	-29 TO 38	49.6
122	620	50	48.1
212	560	100	42.2

NOTES:
1. Design limits are to flange rating ASME B16.5 MATERIAL GROUP 2.2
2. Maximum design temperature for piping exposed to marine environment is 60°C. External painting is required if temperature exceeds the maximum requirements due to corrosion cracking tendency.
3. The use of reduced ball valves is preferred, use full bore ball valves only when necessary for process/ operating requirements.
4. Piston type check valves (0.5" - 1.5") for horizontal mounting only.
5. Bore diameter of welding neck flanges shall match the inside diameter of pipe or pipe fittings it is attached to.
6. Pipe fabrication and inspection to insure 1.0 joint factor.
7. All threaded joints shall be NPT to ASME B1.20.1
8. Stud bolts and nuts shall be fluorocarbon coated blue colour.
9. Gate valve to be used for vent or drain only.
10. Check valve to be used for dissimilar type only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.8	PROCESS MIXED FLOW	C.S HIGH STRENGTH	ASME 300#	0.125" (3 mm)	BX01

PIPE
ASME B36.10M

SIZE	THK. & MATL
0.5" - 0.75"	SCH 160 A106 GR.B SMLS PE
1" - 1.5"	SCH 80 A106 GR.B SMLS PE
2" - 3"	SCH 80 API 5L GR.X65 SMLS BE
4" - 6"	SCH 40 API 5L GR.X65 SMLS BE
8" - 16"	SCH 40 API 5L GR.X65 SMLS BE

FITTINGS
ASME B16.9, ASME B16.11,
MSS SP-75, MSS SP-97

SW ≤ 1.5" ASME B16.11

6000# SIZE ≤0.75" , 3000# SIZE ≥1"
ASTM A105N

ELBOW	SOCKOLET	NIPPLE 75 mm LONG -
TEE	HEX. HEAD -	A106 GR B
REDUCER	BUSHING	SWAGE NIPPLE A106 Gr.B
CAP (SW & THRD)	(0.5" - 0.75")	(MSS SP-95) - THICKNESS
COUPLING		SAME AS PIPE
PLUG (SOLID)		

PE
SCH 160

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SIZE	BUTT WELDING FITTINGS ASTM A234 GR WPB SMLS ASME B16.9
0.5" - 1.5"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP, WELDOLET)

SIZE	BUTT WELDING FITTINGS ASTM A860 GR. WPHY 65 SMLS ASME B16.9
2" - 16"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP, WELDOLET)
16"	THICKNESS SAME AS PIPE (30DEG, 45DEG, 60DEG, 90DEG 3D BEND)

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
0.5" - 1.5"	AS PER ASME B16.5, ASTM A105N BORE AND THK TO MATCH PIPE 300# ASME RF SW	STUD BOLTS ASTM A193 GR B7 FLUOROCARBON COATED/ HEX. NUTS ASTM A194 GR.2H FLUOROCARBON COATED. GASKET - SPIRAL WOUND, RF,300#, 4.5MM THK
0.5" - 1.5"	300# ASME RF BLIND FLANGE	AISI 316, GRAPHITE FILLED, CS OUTER RING & SS INNER RING, ASME B16.20
2" - 16"	AS PER ASME B16.5, ASTM A694 GR. F65 BORE AND THK TO MATCH PIPE 300# ASME RF WN	
2" - 16"	300# ASME RF BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 6"	SPECTACLE BLIND, 300# RF ASME B16.48, ASTM A516 GR 70
8" - 16"	SPADE/ SPACER, 300# RF ASME B16.48, ASTM A516 GR 70

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	BRANCH SIZES (INCHES)													
0.5	TW													
0.75	RW	TW												
1	RW	RW	TW											
1.5	S,N	S,N	RW	TW										
2	S,N	S,N	RT	RT	T									
3	S,N	S,N	S,N	RT	RT	T								
4	S,N	S,N	S,N	S,N	RT	RT	T							
6	S,N	S,N	S,N	S,N	W	RT	RT	T						
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T					
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T				
12	S,N	S,N	S,N	W	W	W	RT	RT	RT	T				
14	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T		
16	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	RT	T	
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	

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LEGENDS
- S SOCKOLET
- W WELDOLET
- T EQUAL TEE BEVEL
- RT REDUCING TEE BEVEL
- N NIPPLEOLET FLANGE
- TW EQUAL TEE SOCKET END
- RW REDUCING TEE SOCKET END

VALVES
ASME B16.34, ASME B16.10, API 602, API 600, API 594,
API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
≤ 0.75"	800# / 3000 Psig SW, HANDWHEEL	BODY: ASTM A216-WCB/ WCC, A105N TRIM: 316SS+STELLITE	GACA2H
BALL			
≤ 0.75"	800# / 3000 Psig SW, LEVER OP. , FLOATING	BODY: ASTM A105N BALL: 316SS STEM: 316SS	BACA2L
≤ 0.75"	800# / 3000 Psig SWxNPTF, LEVER OP., FLOATING	SEATS: RPTFE	BACA6L
0.5" - 4"	300# RF, FLGD, LEVER OP., FLOATING	BODY: ASTM A216-WCB/ WCC, A105N BALL: 316SS	BABA4L BABC4L
6" - 16"	300# RF, FLGD, GEAR OP., TRUNION MOUNTED	STEM: 316SS SEATS: RPTFE	BABB4G BABD4G
GLOBE			
CHECK			
MONOFLANGE VALVE			
≤ 3"	300# RF, FLGDx 1/2" NPTF SINGLE BLOCK AND BLEED	BODY: ASTM A182 F316/ 316L	MVBAAT
SINGLE BLOCK & BLEED VALVE			
≤ 2"	SINGLE BLOCK AND BLEED, 300# RF, LEVER OP.	BODY: ASTM A105N TRIM: SS316	SBBA4L
DOUBLE BLOCK & BLEED VALVE			
≤ 2"	DOUBLE BLOCK AND BLEED, 300# RF, LEVER OP.	BODY: ASTM A105N TRIM: SS316	DBBA4L

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	741.14	-29 TO 38	51.1
122	726.64	50	50.1
212	675.88	100	46.6

NOTES:

1. Design limit are to flange rating per ASME B16.5 MATERIAL GROUP 1.1
2. Welding neck flange to match wall thickness of pipe or fitting it is attached to.
3. Stud bolts and nuts shall be fluorocarbon coated blue colour.
4. The use of reduced bore ball valves is preferred, use full bore ball valves only when necessary for process/ operating requirements.
5. All threaded joints shall be NPT to ASME B1.20.1
6. Gate valve to be used for vent or drain only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.3	FUEL GAS, PROCESS LIQUID	DUPLEX STAINLESS STEEL	ASME 300#	NIL	BD01

PIPE
ASME B36.19M
ASME B36.10M

SIZE	THK. & MATL
0.5" - 1.5"	SCH 80S ASTM A790-UNS S31803 PE, SMLS
2" - 6"	SCH 10S ASTM A790-UNS S31803 BE, SMLS
8" - 10"	SCH 10S ASTM A928-UNS S31803 BE, WELDED
12" - 24"	SCH 20 ASTM A928-UNS S31803 BE, WELDED

FITTINGS
ASME B16.9, ASME B16.11, MSS SP-97

SW ≤ 1.5" ASME B16.11		PE
3000# A182-F51 (UNS S31803)		SCH 80S
ELBOW	SOCKOLET	NIPPLE 75 mm LONG - A182-F51
TEE	HEX. HEAD - BUSHING	SWAGE NIPPLE A182-F51 (MSS-SP-95) - THICKNESS SAME AS PIPE
REDUCER	(0.5" - 0.75")	
CAP (SW & THRD)		
COUPLING		
PLUG (SOLID)		

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SIZE	BUTT WELDING FITTINGS ASTM 815-CL WP-S, UNS S31803 SMLS ASME B16.9
2" - 6"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

SIZE	BUTT WELDING FITTINGS ASTM A815-CL WP-WX, UNS S31803 ASME B16.9
8" - 24"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
	AS PER ASME B16.5, ASTM A182-F51 UNS S31803 BORE AND THK TO MATCH PIPE	STUD BOLTS ASTM A320 GR.L7 FLUOROCARBON COATED/ HEX. NUTS ASTM A194 GR.4 FLUOROCARBON COATED.
0.5" - 1.5"	300# ASME RF SW	GASKET - SPIRAL WOUND, RF, 300#, 4.5MM THK AISI 316, GRAPHITE FILLED, SS OUTER RING & SS INNER RING, ASME B16.20
2" - 24"	300# ASME RF WN	
0.5" - 24"	300# ASME RF BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 6"	SPECTACLE BLIND, 300# RF, ASME B16.48, ASTM A240-UNS S31803
8" - 24"	SPADE/ SPACER, 300# RF, ASME B16.48, ASTM A240-UNS S31803

BRANCH REINFORCEMENT

HEADER SIZES (INCHES) \ BRANCH SIZES (INCHES)	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24
0.5	TW															
0.75	RW	TW														
1	RW	RW	TW													
1.5	S,N	S,N	RW	TW												
2	S,N	S,N	RT	RT	T											
3	S,N	S,N	S,N	RT	RT	T										
4	S,N	S,N	S,N	S,N	RT	RT	T									
6	S,N	S,N	S,N	S,N	W	RT	RT	T								
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T							
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T						
12	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T					
14	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T				
16	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	RT	T			
18	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	T		
20	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
24	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T

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LEGENDS

- S SOCKOLET
- W WELDOLET
- T EQUAL TEE BEVEL
- RT REDUCING TEE BEVEL
- N NIPPLEOLET FLANGE
- TW EQUAL TEE SOCKET END
- RW REDUCING TEE SOCKET END

VALVES
ASME B16.34, API 608, API 602, API 600, API 594

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
≤ 1.5"	800# SW, HANDWHEEL (Note 9)	BODY: ASTM A182-F51 TRIM: UNS S31803	GACF2H
BALL			
0.5" - 1.5"	800# / 3000 Psig SW, LEVER OP., FLOATING	BODY: A182-F51/ A995-F4A TRIM: UNS S31803	BACS2L
0.5" - 1.5"	800# / 3000 Psig SWxNPTF, LEVER OP., FLOATING	SEAT: RPTFE	BACS6L
0.5" - 4"	300# RF, FLGD, LEVER OP., FLOATING	BODY: A182-F51/ A995-F4A TRIM: UNS S31803	BABS4L BABT4L
6" - 24"	300# RF, FLGD, GEAR OP., TRUNNION MOUNTED	SEAT: RPTFE	BABU4G BABV4G
GLOBE			
0.5" - 6"	300# RF, FLGD, HANDWHEEL	BODY: A182-F51/ A995-F4A	GLBE4H
8" - 24"	300# RF, FLGD, GEAR OPERATED	TRIM: UNS S31803 SEAT: RPTFE	GLBE4G
CHECK			
≤ 1.5"	300#, RF, FLGD PISTON TYPE	BODY: A182-F51/ A995-F4A TRIM: UNS S31803	CHBN4N
2" - 24"	300# RF, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: A182-F51/ A995-F4A PLATE: UNS S31803 SEAT: UNS S31803	CHBP4N
MONOFLANGE VALVE			
≤ 3"	300# RF, FLGD x 1/2" NPTF DOUBLE BLOCK AND BLEED	BODY: A182-F51	MVBCAT

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-4 TO 77	749.85	-20 TO 25	51.7
122	749.85	50	51.7
167	742.59	75	51.2
212	735.34	100	50.7
248	707.49	120	48.78

NOTES:

1. Design limits are to flange rating ASME B16.5 MATERIAL GROUP 2.8
2. Maximum design temperature for duplex stainless steel exposed to marine environment is 100°C. External painting is required if temperature exceeds the maximum requirements due to corrosion cracking tendency.
3. The use of reduced ball valves is preferred, use full bore ball valves only when necessary for process/ operating requirements.
4. Piston type check valve (0.5" - 1.5") for horizontal mounting only.
5. Bore diameter of welding neck flanges shall match the inside diameter of pipe or pipe fitting it is attached to.
6. Pipe fabrication and inspection to insure 1.0 joint factor.
7. All threaded joints shall be NPT to ASME B1.20.1
8. Stud bolts and nuts shall be fluorocarbon coated blue colour.
9. Gate valve to be used for vent or drain only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.3	CLOSED DRAIN, FUEL GAS	CARBON STEEL	ASME 600#	0.125" (3 mm)	DC01

PIPE
ASME B36.10M

SIZE	THK. & MATL
0.5" - 1.5"	SCH 160 A106 GR.B SMLS PE
2"	SCH 160 A106 GR.B SMLS BE
3" - 16"	SCH 80 A106 GR.B SMLS BE
18" - 24"	SCH 80 API 5L GR.B BE

FITTINGS
ASME B16.9, ASME B16.11, MSS SP-97

SW ≤ 1.5" ASME B16.11		PE
6000# A105N		SCH 160
ELBOW TEE REDUCER CAP COUPLING PLUG (SOLID)	SOCKOLET HEX. HEAD - BUSHING (0.5" - 0.75")	NIPPLE 75 mm LONG - A106 GR.B SWAGE NIPPLE A106 Gr.B (MSS SP-95) - THICKNESS SAME AS PIPE

SIZE	BUTT WELDING FITTINGS ASTM A234 GR WPB, SMLS ASME B16.9
2" - 16"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

SIZE	BUTT WELDING FITTINGS ASTM A234 GR WPBW, ASME B16.9
18" - 24"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP)

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
0.5" - 1.5"	AS PER ASME B16.5, ASTM A105N BORE AND THK TO MATCH PIPE 600# ASME RF SW	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON COATED/ HEX. NUTS ASTM A194 GR.2H FLUOROCARBON COATED. GASKET - SPIRAL WOUND, RF,/600#, 4.5MM THK AISI 316, GRAPHITE FILLED, CS OUTER RING & SS INNER RING, ASME B16.20
2" - 24"	600# ASME RF WN	
0.5" - 24"	600# ASME RF BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 6"	SPECTACLE BLIND, 600# RF ASME B16.48, ASTM A516 GR 70
8" - 24"	SPADE/ SPACER, 600# RF ASME B16.48, ASTM A516 GR 70

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24
0.5	TW															
0.75	RW	TW														
1	RW	RW	TW													
1.5	S,N	S,N	RW	TW												
2	S,N	S,N	RT	RT	T											
3	S,N	S,N	S,N	RT	RT	T										
4	S,N	S,N	S,N	S,N	RT	RT	T									
6	S,N	S,N	S,N	S,N	W	RT	RT	T								
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T							
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T						
12	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T					
14	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T				
16	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	RT	T			
18	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	T		
20	S,N	S,N	S,N	S,N	W	W	W	W	W	RT	RT	RT	RT	RT	T	
24	S,N	S,N	S,N	S,N	W	W	W	W	W	W	RT	RT	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24

BRANCH SIZES (INCHES)

6

LEGENDS

- S SOCKOLET
- W WELDOLET
- T EQUAL TEE BEVEL
- RT REDUCING TEE BEVEL
- N NIPPLEOLET FLANGE
- TW EQUAL TEE SOCKET END
- RW REDUCING TEE SOCKET END

VALVES
ASME B16.34, ASME B16.10, API 602, API 600, API 594, API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
0.5" - 1.5"	800# / 3000 Psig SW, HANDWHEEL	BODY: ASTM A216-WCB/ WCC, A105N TRIM: 316SS+STELLITE	GACA2H
BALL			
0.5" - 1.5"	800# / 3000 Psig SW, LEVER OP. , FLOATING	BODY: A105N BALL: 316SS STEM: 316SS SEAT: RPTFE	BACA2L
0.5" - 1.5"	800# / 3000 Psig SW/xNPTF, LEVER OP., FLOATING		BACA6L
0.5" - 1.5"	600# RF, FLGD, LEVER OP., FLOATING	BODY: ASTM A216-WCB/ WCC, A105N BALL: 316SS STEM: 316SS SEAT: RPTFE	BADA4L BADC4L
2" - 3"	600# RF, FLGD, LEVER OP., TRUNNION MOUNTED		BADB4L BADD4L
4" - 24"	600# RF, FLGD, GEAR OP., TRUNNION MOUNTED		BADB4G BADD4G
GLOBE			
0.5" - 6"	600# RF, FLGD, HANDWHEEL	BODY: ASTM A216-WCB/ WCC, A105N TRIM: 316SS + STELLITE	GLDA4H
8"-16"	600# RF, FLGD, GEAR OPERATED	SEATS: ASTM A105 + STELLITE	GLDA4G
CHECK			
≤ 1.5"	600# RF, FLGD, PISTON TYPE	BODY: ASTM A216-WCB/ WCC, A105N TRIM: 316SS	CHDA4N
2" - 10"	600# RF, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: ASTM A216-WCB/ WCC, A105N PLATE: 316SS	CHDC4N
12" - 24"	600# RF, FLGD, DUAL PLATE	SEAT: 316SS + STELLITE	CHDD4N
2" - 24"	600# RF, FLGD, SWING TYPE (NOTE 7)		CHDB4N
MONOFLANGE VALVE			
≤ 3"	600# RF, FLGDx 1/2" NPTF SINGLE BLOCK AND BLEED	BODY: ASTM A182 F316/ 316L	MVDAAT
SINGLE BLOCK & BLEED VALVE			
≤ 2"	SINGLE BLOCK AND BLEED, 600# RF, LEVER OP.	BODY: ASTM A105N TRIM: SS316	SBDA4L
DOUBLE BLOCK & BLEED VALVE			
≤ 2"	DOUBLE BLOCK AND BLEED, 600# RF, LEVER OP.	BODY: ASTM A105N TRIM: SS316	DBDA4L

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	1480.84	-29 TO 38	102.1
122	1453.28	50	100.2
212	1351.75	100	93.2

NOTES:

1. Design limits are to flange rating per ASME B16.5 MATERIAL GROUP 1.1.
2. Welding neck neck flange to match wall thickness of pipe or fitting it is attached to.
3. Stud bolts and nuts shall be fluorocarbon coated blue colour.
4. The use of reduced bore ball valves is preferred, used full bore ball valves only when necessary for process/operating requirements.
5. Piston type check valves (0.5" - 1.5") are for horizontal mounting only.
6. Gate valve to be used for vent or drain only.
7. Check valve to be used for dissimilar type only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.3	PROCESS MIXED FLOW, PROCESS LIQUID, PROCESS GAS, CLOSED DRAIN, HP FLARE, PROCESS WATER, VESSEL TRIM	STAINLESS STEEL	ASME 600#	NIL	DS01

PIPE
ASME B36.19M

SIZE	THK. & MATL
0.5" - 1.5"	SCH. 80S ASTM A312-TP316/316L, PE
2" - 4"	SCH. 40S ASTM A312-TP316/316L, BE
6"	SCH. 80S ASTM A312-TP316/316L, BE
8" - 10"	SCH. 80S ASTM A358-TP316/316L-1 (WELDED)
12" - 24"	SCH. 80 ASTM A358-TP316/316L-1 (WELDED)

FITTINGS
ASME B16.9, ASME B16.11, MSS SP-97

SW ≤ 1.5" ASME B16.11		PE
3000# A182-F316/316L		SCH. 80S
ELBOW TEE REDUCER CAP (SW & THRD) COUPLING	PLUG (SOLID) SOCKOLET HEX. HEAD - BUSHING (0.5" - 0.75")	NIPPLE 75 mm LONG - A182-F316/316L SWAGE NIPPLE A182-F316/ 316L (MSS SP-95) - THICKNESS SAME AS PIPE 6

SIZE	BUTT WELDING FITTINGS ASTM A403-WP316/316L, SMLS ASME B16.9
2" - 6"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

SIZE	BUTT WELDING FITTINGS ASTM A403-WP-WX316/316L, ASME B16.9
8" - 24"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP, WELDOLET)

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
	AS PER ASME B16.5, ASTM A182-F316/316L	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON
	BORE AND THK TO MATCH PIPE	COATED/ HEX. NUTS ASTM A194 GR.2H
0.5" - 1.5"	600# ASME RF SW	FLUOROCARBON COATED
		GASKET - SPIRAL WOUND, RF, 600#, 4.5MM THK
2" - 24"	600# ASME RF WN	AISI 316, GRAPHITE FILLED, SS OUTER RING &
		SS INNER RING, ASME B16.20
0.5" - 24"	600# ASME RF BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 6"	SPECTACLE BLIND, 600# RF, ASME B16.48, ASTM A240-TP316/ 316L
8" - 24"	SPADE/ SPACER, 600# RF, ASME B16.48, ASTM A240-TP316/ 316L

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24
0.5	TW															
0.75	RW	TW														
1	RW	RW	TW													
1.5	S,N	S,N	RW	TW												
2	S,N	S,N	RT	RT	T											
3	S,N	S,N	S,N	RT	RT	T										
4	S,N	S,N	S,N	S,N	RT	RT	T									
6	S,N	S,N	S,N	S,N	S,N	W	RT	RT	T							
8	S,N	S,N	S,N	S,N	S,N	W	W	RT	RT	T						
10	S,N	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T					
12	S,N	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T				
14	S,N	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T			
16	S,N	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	RT	T		
18	S,N	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	T	
20	S,N	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	RT	T
24	S,N	S,N	S,N	S,N	S,N	W	W	W	W	W	RT	RT	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24

BRANCH SIZES (INCHES)

6

LEGENDS
- S SOCKOLET
- W WELDOLET
- T EQUAL TEE BEVEL
- RT REDUCING TEE BEVEL
- N NIPPLEOLET FLANGE
- TW EQUAL TEE SOCKET END
- RW REDUCING TEE SOCKET END

VALVES
ASME B16.34, ASME B16.10, API 602, API 600, API 594, API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
0.5" - 1.5"	800# / 3000 Psig SW, HANDWHEEL (Note 9)	BODY: A182-F316/316L TRIM: AISI 316/316L + STELLITE	GACC2H
BALL			
0.5" - 1.5"	800# / 3000 Psig SW, LEVER OP., FLOATING	BODY: A182-F316/316L BALL/ STEM: 316/316LSS SEATS: RPTFE	BACE2L
0.5" - 1.5"	800# / 3000 Psig SW/xNPTF, LEVER OP., FLOATING		BACE6L
0.5" - 1.5"	600# RF, FLGD, LEVER OP., FLOATING	BODY: A182-F316/316L, A351 CF8M BALL/STEM: 316/316LSS SEATS: RPTFE	BADE4L BADG4L
2" - 3"	600# RF, FLGD, LEVER OP., TRUNNION MOUNTED		BADF4L BADH4L
4" - 24"	600# RF, FLGD, GEAR OP., TRUNNION MOUNTED		BADF4G BADH4G
GLOBE			
0.5" - 6"	600# RF, FLGD, HANDWHEEL	BODY: A182-F316/316L, A351 CF8M TRIM: AISI 316/316L + STELLITE	GLDC4H
8"-16"	600# RF, FLGD, GEAR OPERATED		GLDC4G
CHECK			
≤ 1.5"	600# RF, FLGD PISTON TYPE	BODY: A182-F316/316L, A351 CF8M TRIM: AISI 316/316L	CHDE4N
2" - 10"	600# RF, DUAL PLATE, WAFER SOLID LUG TYPE	BODY: A182-F316/316L TRIM: AISI 316/316L SEAT: AISI 316/316L + STELLITE	CHDG4N
12" - 24"	600# RF, FLGD, DUAL PLATE		CHDH4N
2" - 24"	600# RF, FLGD, SWING TYPE (NOTE 10)		CHDF4N
MONOFLANGE VALVE			
≤ 3"	600# RF, FLGDx 1/2" NPTF SINGLE BLOCK AND BLEED	BODY: ASTM A182 F316/ 316L	MVDAAT
SINGLE BLOCK & BLEED VALVE			
≤ 2"	SINGLE BLOCK AND BLEED, 150# RF, LEVER OP.	BODY: ASTM A182 F316 / 316L TRIM: SS316	SBDB4L
DOUBLE BLOCK & BLEED VALVE			
≤ 2"	DOUBLE BLOCK AND BLEED, 150# RF, LEVER OP.	BODY: ASTM A182 F316 / 316L TRIM: SS316	DBDB4L

NOTES:

1. Design limits are to flange rating ASME B16.5 MATERIAL GROUP 2.2
2. Maximum design temperature for piping exposed to marine environment is 60°C. External painting is required if temperature exceeds the maximum requirements due to corrosion cracking tendency
3. The use of reduced ball valves is preferred, use full bore ball valves only when necessary for process/ operating requirements
4. Piston type check valves (0.5" - 1.5") for horizontal mounting only
5. Bore diameter of welding neck flanges shall match the inside diameter of pipe or pipe fittings it is attached to
6. Pipe fabrication and inspection to insure 1.0 joint factor
7. All threaded joints shall be NPT to ASME B1.20.1
8. Stud bolts and nuts shall be fluorocarbon coated blue colour
9. Gate valve to be used for vent or drain only
10. Check valve to be used for dissimilar type only

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	1440.22	-29 TO 38	99.3
122	1395.26	50	96.2
212	1224.12	100	84.4

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.3	PROCESS MIXED FLOW, PROCESS LIQUID, VESSEL TRIM	CARBON STEEL	ASME 1500#	0.125" (3 mm)	FC01

PIPE — ASME B36.10M

SIZE	THK. & MATL
0.5" - 1.5"	SCH XXS A106 GR.B SMLS PE
2" - 3"	SCH 160 A106 GR.B SMLS BE
4" - 14"	SCH 120 A106 GR.B SMLS BE

FITTINGS — ASME B16.9, ASME B16.11, MSS SP-97

SW ≤ 1.5" ASME B16.11		PE
6000# ASTM A105N		SCH XXS
ELBOW TEE REDUCER CAP COUPLING PLUG (SOLID)	SOCKOLET HEX. HEAD - BUSHING (0.5" - 0.75")	NIPPLE 75 mm LONG - A106 GR.B SWAGE NIPPLE A106 Gr.B (MSS SP-95) - THICKNESS SAME AS PIPE 6

SIZE	BUTT WELDING FITTINGS ASTM A234 GR WPB, SMLS ASME B16.9
2" - 14"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP,WELDOLET)

VALVES — ASME B16.34, ASME B16.10, API 602, API 600, API 6D, BS 1873, BS EN ISO 17292, BS EN ISO 15761

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
0.5" - 1.5"	1500# / 6000 Psig SW, HANDWHEEL	BODY: ASTM A216-WCB/ WCC, A105N TRIM: 316SS+STELLITE	GAFA2H
BALL			
0.5" - 1.5"	1500# / 6000 Psig SW, LEVER OP., TRUNION MOUNTED	BODY: ASTM A105N BALL/ STEM: 316SS SEATS: DEVLON V	BAFB2L
0.5" - 1.5"	1500# / 6000 Psig SWxNPTF, LEVER OP., TRUNION MOUNTED		BAFB6L
0.5" - 2"	1500# RTJ, FLGD, LEVER OP., TRUNNION MOUNTED	BODY: ASTM A216-WCB/ WCC, A105N BALL/ STEM: 316SS SEATS: DEVLON V	BAFB5L BAFD5L
3" - 14"	1500# RTJ, FLGD, GEAR OP., TRUNNION MOUNTED		BAFB5G BAFD5G
GLOBE			
0.5" - 2"	1500# RTJ, FLGD, HANDWHEEL	BODY: ASTM A216-WCB/ WCC, A105N TRIM: 316SS + STELLITE SEATS: ASTM A105 + STELLITE	GLFA5H
3" - 8"	1500# RTJ, FLGD, GEAR OPERATED		GLFA5G
CHECK			
≤ 1.5"	1500# RTJ, FLGD, PISTON TYPE	BODY: ASTM A216-WCB/ WCC, A105N TRIM: 316SS	CHFA5N
2" - 14"	1500# RTJ, FLGD, DUAL PLATE	BODY: ASTM A216-WCB/ WCC, A105N PLATE: 316SS SEAT: 316SS + STELLITE	CHFD5N
MONOFLANGE VALVE			
≤ 2"	1500# RTJ, FLGDx 1/2" NPTF DOUBLE BLOCK AND BLEED	BODY: ASTM A182 F316/ 316L	MVFBBT
DOUBLE BLOCK AND BLEED VALVE			
≤ 2"	DBB VALVE, 1500# RTJ, FLANGED END	BODY: ASTM A216-WCB/ WCC, A105N BALL: 316SS STEM: 316SS SEATS: DEVLON V	DBFA5L

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
0.5 - 1.5"	AS PER ASME B16.5, ASTM A105N BORE AND THK TO MATCH PIPE 1500# ASME RTJ SW	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON COATED/ HEX. NUTS ASTM A194 GR.2H FLUOROCARBON COATED. GASKET - SOFT IRON, CADMIUM PLATED, 1500#, RTJ, OVAL RING TYPE, ASME B16.20
2" - 14"	1500# ASME RTJ WN	
0.5" - 14"	1500# ASME RTJ BLIND FLANGE	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
0.5" - 6"	SPECTACLE BLIND, 1500# RTJ ASME B16.48, ASTM A516 GR 70
8" - 14"	SPADE/ SPACER, 1500# RTJ ASME B16.48, ASTM A516 GR 70

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

0.5	TW											
0.75	RW	TW										
1	RW	RW	TW									
1.5	S,N	S,N	RW	TW								
2	S,N	S,N	RT	RT	T							
3	S,N	S,N	S,N	RT	RT	T						
4	S,N	S,N	S,N	S,N	RT	RT	T					
6	S,N	S,N	S,N	S,N	W	RT	RT	T				
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T			
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T		
12	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T	
14	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14

BRANCH SIZES (INCHES)

6

LEGENDS

- S SOCKOLET
- W WELDOLET
- T EQUAL TEE BEVEL
- RT REDUCING TEE BEVEL
- N NIPPLEOLET FLANGE
- TW EQUAL TEE SOCKET END
- RW REDUCING TEE SOCKET END

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	1440.22	-29 TO 38	255.3
122	1395.26	50	250.6
212	1224.12	100	233.0

NOTES:

1. Design limits are to flange rating per ASME B16.5 MATERIAL GROUP 1.1.
2. Welding neck neck flange to match wall thickness of pipe or fitting it is attached to.
3. Stud bolts and nuts shall be fluorocarbon coated blue colour.
4. The use of reduced bore ball valves is preferred, used full bore ball valves only when necessary for process/operating requirements.
5. All threaded joint shall be NPT to ASME B1.20.1.
6. Gate valve to be used for vent or drain only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
API RP 14E ASME B31.8	PROCESS MIXED FLOW	C.S HIGH STRENGTH	ASME 1500#	0.125" (3 mm)	FX01

PIPE
ASME B36.10M

SIZE	THK. & MATL
2"	SCH 160 API 5L GR X65 SMLS BE
12"	SCH 80 API 5L GR X65 SMLS BE
26"	29mm THK. API 5L GR X65 BE (WELDED) (Note 6)

FITTINGS
ASME B16.9, MSS SP-75, MSS SP-97

SIZE	BUTT WELDING FITTINGS ASTM A860 GR. WPHY 65 ASME B16.9, MSS SP-75, MSS SP-97
2" - 24"	THICKNESS SAME AS PIPE (ELB, TEE, RED, CAP)
26"	THICKNESS SAME AS PIPE RED. TEE (Note 6) 30DEG, 45DEG, 60DEG, 90DEG 3D BEND (Note 8)

SIZE	BUTT WELDING FITTINGS ASTM A694 GR. F65, MSS SP-97
2" - 10"	THICKNESS SAME AS PIPE WELDOLET

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
2" - 24"	AS PER ASME B16.5, ASTM A694 GR. F65 BORE AND THK TO MATCH PIPE 1500# ASME RTJ WN	STUD BOLTS ASTM A193 GR.B7 FLUOROCARBON COATED/ HEX. NUTS ASTM A194 GR.2H FLUOROCARBON COATED. GASKET - SOFT IRON, CADMIUM PLATED, 1500#, RTJ, OVAL RING TYPE, ASME B16.20 (Note 6 for 26")
2" - 24"	1500# ASME RTJ BLIND FLANGE	
26"	AS PER ASME B16.47, Series B, ASTM A694 GR. F65 BORE AND THK TO MATCH PIPE 1500# ASME RTJ WN (Note 6, 7)	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
2" - 6"	SPECTACLE BLIND, 1500# RTJ ASME B16.48, ASTM A516 GR 70
8" - 24"	SPADE/ SPACER, 1500# RTJ ASME B16.48, ASTM A516 GR 70
26"	SPADE/ SPACER, 1500# RTJ ASME B16.47 Series B, ASTM A516 GR 70

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24	26
0.5	TW																
0.75	RW	TW															
1	RW	RW	TW														
1.5	S,N	S,N	RW	TW													
2	S,N	S,N	RT	RT	T												
3	S,N	S,N	S,N	RT	RT	T											
4	S,N	S,N	S,N	S,N	RT	RT	T										
6	S,N	S,N	S,N	S,N	W	RT	RT	T									
8	S,N	S,N	S,N	S,N	W	W	RT	RT	T								
10	S,N	S,N	S,N	S,N	W	W	RT	RT	RT	T							
12	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	T						
14	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	T					
16	S,N	S,N	S,N	S,N	W	W	W	RT	RT	RT	RT	RT	T				
18	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	T			
20	S,N	S,N	S,N	S,N	W	W	W	W	RT	RT	RT	RT	RT	RT	T		
24	S,N	S,N	S,N	S,N	W	W	W	W	W	RT	RT	RT	RT	RT	RT	T	
26	S,N	S,N	S,N	S,N	W	W	W	W	W	RT	RT	RT	RT	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6	8	10	12	14	16	18	20	24	26

BRANCH SIZES (INCHES)

LEGENDS

- S SOCKOLET
- W WELDOLET
- T EQUAL TEE BEVEL
- RT REDUCING TEE BEVEL
- N NIPPLEOLET FLANGE
- TW EQUAL TEE SOCKET END
- RW REDUCING TEE SOCKET END

VALVES
ASME B16.34, ASME B16.10, API 6D, BS EN ISO 17292

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
0.5" - 1.5"	1500# / 6000 Psig SW, HANDWHEEL	BODY: ASTM A350-LF2 CL.1 TRIM: 316SS+STELLITE	GAFA2H
BALL			
0.5" - 1.5"	1500# / 6000 Psig SW, LEVER OP., TRUNION MOUNTED	BODY: ASTM A350-LF2 CL.1, A352-LCC BALL/ STEM: 316SS	BAFP2L
0.5" - 1.5"	1500# / 6000 Psig SW/NPTF, LEVER OP., TRUNION MOUNTED	SEATS: DEVLON V	BAFP6L
2"	1500# RTJ, FLGD, LEVER OP., TRUNNION MOUNTED	BODY: ASTM A350-LF2 Class 1, A352-LCC BALL: 316SS	BAFP5L BAFL5L
3" - 24"	1500# RTJ, FLGD, GEAR OP., TRUNNION MOUNTED	STEM: 316SS SEAT: DEVLON V	BAFP5G BAFL5G
26"	1500# RTJ, FLGD, GEAR OP., TRUNNION MOUNTED (Note 6, 7)		BAFP5G BAFL5G
GLOBE			
CHECK			
MONOFLANGE VALVE			
≤ 2"	1500# RTJ, FLGDx 1/2" NPTF DOUBLE BLOCK AND BLEED	BODY: ASTM A182 F316/ 316L	MVFB8T
DOUBLE BLOCK AND BLEED VALVE			
≤ 2"	DBB VALVE, 1500# RTJ, FLANGED END	BODY: ASTM A216-WCB/ WCC, A105N BALL: 316SS STEM: 316SS SEATS: DEVLON V	DBFA5L

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	3702.81	-29 TO 38	255.3
122	3634.65	50	250.6
212	3379.38	100	233.0

NOTES:

1. Design limit are to flange rating per ASME B16.5 MATERIAL GROUP 1.1
2. Welding neck flange to match wall thickness of pipe or fitting it is attached to
3. Stud bolts and nuts shall be fluorocarbon coated blue colour
4. The use of reduced bore ball valves is preferred, use full bore ball valves only when necessary for process/ operating requirements.
5. All threaded joints shall be NPT to ASME B1.20.1
6. For size 26" Internal Diameter shall be selected 621.8mm Outside Diameter shall therefore be 679.8mm (with 29.00mm wall thickness)
7. Refer to BK.TNG-001-TS-PI-SP-006 - Specification for 26" Flange and Accessories.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
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CODES API RP 14E ASME B31.3	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
	HP FLARE, CLOSED DRAIN	CARBON STEEL	API 10000 Psi	0.125" (3 mm)	HC01

PIPE — ASME B36.10M

SIZE	SCH /WT	API 10000 Psi 6BX FLG	MATL.
0.5"	XXS		API 5L GR. X60 SMLS
0.75"	XXS		
1"	XXS		
1.5"	XXS		
2"	XXS	1.13/16"	
3"	XXS	2.9/16"	
4"	18mm	3.1/16"	
6"	25mm	4.1/16"	

FITTINGS — MSS SP-75, MSS SP-97

SIZE	
0.5" - 6"	BUTT WELDING FITTINGS ASTM A680 GR WPHY 60, SMLS MSS SP-75, MSS SP-97 THICKNESS SAME AS PIPE (CAP, ELBOW, TEE, RED.)
SIZE	BUTT WELDING FITTINGS ASTM A694 GR F60, SMLS MSS SP-75, MSS SP-97
0.75" - 2"	THICKNESS SAME AS PIPE BRANCH FITTING FLANGED OUTLET END (API 10000 Psi) (Note 6)
0.75" - 2"	WELDOLET

VALVES — API 6A, ASME B16.34

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
BALL			
1.13/16" - 3.1/16"	API 10000 Psi, RTJ, FLGD Type 6BX, GEAR OP., TRUNNION MOUNTED	BODY: API 6A 60K CL.CC TRIM: ASTM A182-F51 + TCC	BAHB6G
GLOBE			
CHECK			
DOUBLE BLOCK & BLEED VALVE			
1/2" - 3/4"	API 10000 Psi, SW x NPTF, TRUNNION MOUNTED, LEVER OP. (WITH 01 PUP END PE)	BODY: API 6A 60K CL.CC TRIM: ASTM A182-F51 + TCC	DBHB6L
MONOFLANGE VALVE			
1.13/16"	API 10000 Psi, RTJ TYPE 6BX FLGDx 1/2" NPTF DOUBLE BLOCK AND BLEED	BODY: API 6A 60K CL.CC TRIM: ASTM A182-F51 + TCC	MVHBBT

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
1.13/16" - 4.1/16"	AS PER API 6A, ASTM A694 GR F60 BORE AND THK TO MATCH PIPE API 10000Psi, RTJ WN, TYPE 6BX	STUD BOLTS ASTM A193-GR.B7 FLUOROCARBON COATED/ HEX. NUTS ASTM A194 GR.2H FLUOROCARBON COATED GASKET - API 10000 Psi, RTJ, AISI 316, TYPE 6BX PRESSURE ENERGIZED SEAL
1.13/16" - 4.1/16"	API 10000 Psi, RTJ BLIND FLANGE TYPE 6BX	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
1.13/16" - 4.1/16"	SPADE/ SPACER, API 10000 Psi RTJ, Type 6BX, ASTM A694 GR F60

BRANCH REINFORCEMENT

HEADER SIZES (INCHES) / BRANCH SIZES (INCHES)

HEADER \ BRANCH	0.5	0.75	1	1.5	2	3	4	6
0.5	T							
0.75	RT	T						
1	RT	RT	T					
1.5	W,N	RT,N	RT	T				
2	W,N	W,N	RT,N	RT	T			
3	W,N	W,N	W,N	RT	RT	T		
4	W,N	W,N	W,N	RT	RT	RT	T	
6	W,N	W,N	W,N	W,N	W	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6

LEGENDS

W WELDOLET
T TEE
RT REDUCING TEE
N NIPPLEOLET FLANGE

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	9993.1	-29 TO 38	689
149	9819.05	65	677
199.4	9456.46	93	652
249.8	9282.42	121	640

NOTES:

1. Design limit is based on API 6A, at process design condition of 405 Barg @ 100°C and ASME B31.3
2. The use of reduced bore ball valves is preferred; use full bore ball valves only when necessary for process/ operating requirements
3. Bore diameter of welding neck flange shall match inside diameter of pipe or pipe fittings it is attached to
4. All flanged connections shall be as per API 6A, 10000 Psi Type 6BX
5. Stud bolts and nuts shall be fluorocarbon coated blue colour
6. Gate valve to be used for vent or drain only

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
Rev.	6

CODES API RP 14E ASME B31.3	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
	METHANOL	CARBON STEEL	API 10000 Psi	0.0625" (1.5 mm)	HC02

PIPE
ASME B36.10M

SIZE	SCH /WT	API 10000 Psi 6BX FLG	MATL.
0.5"	XXS		API 5L GR. X60 SMLS
0.75"	XXS		
1"	XXS		
1.5"	XXS		
2"	XXS	1.13/16"	
3"	XXS	2.9/16"	
4"	XXS	3.1/16"	

FITTINGS
MSS SP-75, MSS SP-97

SIZE	BUTT WELDING FITTINGS ASTM A680 GR WPHY 60, SMLS MSS SP-75, MSS SP-97
0.5" - 4"	THICKNESS SAME AS PIPE (CAP, ELBOW, TEE, RED.)

SIZE	BUTT WELDING FITTINGS ASTM A694 GR F60, SMLS MSS SP-75, MSS SP-97
0.75" - 2"	THICKNESS SAME AS PIPE BRANCH FITTING FLANGED OUTLET END (API 10000 Psi)
0.75" - 1"	WELDOLET

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
1.13/16" - 3.1/16"	AS PER API 6A, ASTM A694 GR F60 BORE AND THK TO MATCH PIPE API 10000Psi, RTJ WN, TYPE 6BX	STUD BOLTS ASTM A193-GR.B7 FLUOROCARBON COATED/ HEX. NUTS ASTM A194 GR.2H FLUOROCARBON COATED GASKET - API 10000 Psi, RTJ, AISI 316, TYPE 6BX PRESSURE ENERGIZED SEAL (Note 6)
1.13/16" - 3.1/16"	API 10000 Psi, RTJ BLIND FLANGE TYPE 6BX	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
1.13/16" - 3.1/16"	SPADE/ SPACER, API 10000 Psi RTJ, Type 6BX, ASTM A694 GR F60

BRANCH REINFORCEMENT

HEADER SIZES (INCHES) / BRANCH SIZES (INCHES)

	0.5	0.75	1	1.5	2	3	4
0.5	T						
0.75	RT	T					
1	RT	RT	T				
1.5	W,N	RT,N	RT	T			
2	W,N	W,N	RT,N	RT	T		
3	W,N	W,N	W,N	RT	RT	T	
4	W,N	W,N	W,N	RT	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4

6

LEGENDS

W WELDOLET
T TEE
RT REDUCING TEE
N NIPPLEOLET FLANGE

VALVES
API 6A, ASME B16.34

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
BALL			
1.13/16" - 3.1/16"	API 10000 Psi, RTJ, FLGD Type 6BX, GEAR OP., TRUNNION MOUNTED	BODY: API 6A 60K CL.CC BALL: TRIM: ASTM A182-F51 SEATS: ASTM A182-F51 + TCC	BAHB5G
GLOBE			
CHECK			
DOUBLE BLOCK & BLEED VALVE			
1/2" - 3/4"	API 10000 Psi, SW x NPTF, TRUNNION MOUNTED, LEVER OP. (WITH 01 PUP END PE)	BODY: API 6A 60K CL.CC TRIM: ASTM A182-F51 + TCC	DBHB6L
MONOFLANGE VALVE			
1.13/16"	API 10000 Psi, RTJ TYPE 6BX FLGDx 1/2" NPTF DOUBLE BLOCK AND BLEED	BODY: API 6A 60K CL.CC TRIM: ASTM A182-F51 + TCC	MVHB8T

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	9993.1	-29 TO 38	689
149	9819.05	65	677
199.4	9455.46	93	652
249.8	9282.42	121	640

NOTES:

1. Design limit is based on API 6A, at process design condition of 440 Barg @ 100°C and ASME B31.3
2. The use of reduced bore ball valves is preferred, use full bore ball valves only when necessary for process/ operating requirements.
3. Bore diameter of welding neck flange shall match inside diameter of pipe or pipe fittings it is attached to.
4. All flanged connections shall be as per API 6A, 10000 Psi Type 6BX.
5. Stud bolts and nuts shall be fluorocarbon coated blue colour.
6. Gate valve to be used for vent or drain only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
APPENDIX No.	2
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CODES API RP 14E ASME B31.3	SERVICE	MATERIAL	CLASS RATING	CORR. ALLOW	PIPING CLASS No.
	PROCESS MIXED FLOW, CLOSED DRAIN, WAX INHIBITOR	STAINLESS STEEL	API 10000 Psi	NIL	**HS01**

PIPE
ASME B36.10M

SIZE	SCH /WT	API 10000 Psi 6BX FLG	MATL
0.5"	160		ASTM A312-TP316/ 316L
0.75"	160		
1"	160		
1.5"	XXS		
2"	XXS	1.13/16"	
3"	16mm	2.9/16"	
4"	21mm	3.1/16"	
6"	30mm	4.1/16"	

FITTINGS
MSS SP-75, MSS SP-97

SIZE	BUTT WELDING FITTINGS ASTM A403-WP316/316L SMLS MSS SP-75, MSS SP-97
0.5" - 6"	THICKNESS SAME AS PIPE (CAP, ELBOW, TEE, RED.)
0.75" - 2"	THICKNESS SAME AS PIPE WELDOLET 6

VALVES
API 6A, ASME B16.34

SIZE	DESCRIPTION	MATERIAL	CODE
GATE			
1.13/16" AND 3/4"	API 10000 Psi, RTJ, FLGD Type 6BX, HANDWHEEL (Note 7)	BODY: API 6A 60K CL CC TRIM: ASTM A182-F51 + TCC	GAHE5H
BALL			
1.13/16" - 5.1/8" AND 1"	API 10000 Psi, RTJ, FLGD Type 6BX, GEAR OP., TRUNNION MOUNTED	BODY: API 6A 60K CL CC BALL: TRIM: ASTM A182-F51 SEATS: ASTM A182-F51 + TCC	BAHF5G
GLOBE			
CHECK			
1.13/16"	API 10000 Psi, RTJ, FLGD Type 6BX, SWING TYPE	BODY: API 6A 60K CL CC PLATE: ASTM A182-F51 SEATS: ASTM A182-F51 + TCC	CHHF5N
2.9/16" - 5.1/8"	API 10000 Psi, RTJ, Type 6BX DUAL PLATE, WAFER SOLID LUG TYPE		CHHG5N
DOUBLE BLOCK AND BLEED VALVE			
1/2" - 3/4"	API 10000 Psi, SW x NPTF, TRUNNION MOUNTED, LEVER OP. (WITH 01 PUP END PE)	BODY: API 6A 60K CL CC PLATE: ASTM A182-F51 SEATS: ASTM A182-F51 + TCC	DBHB6L
1.13/16" - 5.1/8"	API 10000 Psi, RTJ, FLGD Type 6BX, GEAR OP., TRUNNION MOUNTED		DBHB5G
MONOFLANGE VALVE			
1.13/16"	API 10000 Psi, RTJ TYPE 6BX FLGDx 1/2" NPTF DOUBLE BLOCK AND BLEED	BODY: API 6A 60K CL CC TRIM: ASTM A182-F51 + TCC	MVHB8T

MECHANICAL JOINTS

SIZE	FLANGES	BOLTS & GASKETS
1.13/16" - 4.1/16"	AS PER API 6A, ASTM A182-F51 BORE AND THK TO MATCH PIPE API 10000Psi, RTJ WN, TYPE 6BX	STUD BOLTS ASTM A453-660 FLUOROCARBON COATED/ HEX. NUTS ASTM A453-660 FLUOROCARBON COATED. GASKET - API 10000 Psi, RTJ, TYPE 6BX 160 HB MAX SS316
1.13/16" - 4.1/16"	API 10000 Psi, RTJ BLIND FLANGE TYPE 6BX	

MISCELLANEOUS

SIZE	SPEC BLIND, BLIND/SPACER
1.13/16" - 4.1/16"	SPADE/ SPACER, API 10000 Psi RTJ, Type 6BX, ASTM A182-F51

BRANCH REINFORCEMENT

HEADER SIZES (INCHES)

	0.5	0.75	1	1.5	2	3	4	6
0.5	T							
0.75	RT	T						
1	RT	RT	T					
1.5	W,N	RT,N	RT	T				
2	W,N	W,N	RT,N	RT	T			
3	W,N	W,N	W,N	RT	RT	T		
4	W,N	W,N	W,N	RT	RT	RT	T	
6	W,N	W,N	W,N	W,N	W	RT	RT	T
NPS	0.5	0.75	1	1.5	2	3	4	6

BRANCH SIZES (INCHES)

6

LEGENDS

- W WELDOLET
- T TEE
- RT REDUCING TEE
- N NIPPLEOLET FLANGE

PRESSURE-TEMPERATURE RATING

TEMP, °F	PRESS, Psig	TEMP, °C	PRESS, Barg
-20.2 TO 100.4	9993.1	-29 TO 38	689
149	9819.05	65	677
199.4	9456.46	93	652
249.8	9282.42	121	640

NOTES:

1. Design limit is based on API 6A, at process design condition of 405 Barg @ 100°C and ASME B31.3
2. Maximum design pressure for piping exposed to marine environment is 60°C. External painting is required if temperature exceeds the maximum requirements due to corrosion cracking tendency.
3. The use of reduced bore ball valves is preferred, use full bore ball valves only when necessary for process/ operating requirements.
4. Bore diameter of welding neck flange shall match inside diameter of pipe or pipe fittings it is attached to.
5. All flanged connections shall be as per API 6A, 10000 Psi Type 6BX.
6. Stud bolts and nuts shall be fluorocarbon coated blue colour.
7. Gate valve to be used for vent or drain only.

PROJECT NAME	BK.TNG WELLHEAD PLATFORM
DOC. No.	BK.TNG-001-TS-PI-SP-001
DOC. TITLE	PIPING MATERIAL SPECIFICATION
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RESEARCH & ENGINEERING INSTITUTE

DETAIL ENGINEERING SERVICE FOR BK.TNG WELLHEAD PLATFORM

PROJECT NAME : DETAIL ENGINEERING SERVICE FOR BK.TNG WELLHEAD PLATFORM

DOCUMENT TITLE : SPECIFICATION FOR MANUAL VALVES

DOCUMENT No. : BK.TNG-001-TS-PI-SP-002

CONTROLLED

REV.	DES.	DATE	PREPARED	CHECKED	AGREED	DIS. LEADER	ENG. MANAGER	PRO. MANAGER
2	IFA	31/07/2014						
1	IFA	20/07/2014	L.T.DUONG	L.T.DUONG		N.T.HAI	P.H.VIET	L.V. DZUNG
0	IFA	25/04/2014	L.T.DUONG	L.T.DUONG		N.T.HAI	P.H.VIET	L.V. DZUNG

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1.0 GENERAL

1.1 Background

Thien Ung field is located in the middle part of Block 04-3 in the Nam Con Son Basin, offshore the Socialist Republic of Vietnam, approximately 15 km of Dai Hung field, and approximately 270 km southeast of Vung Tau. The Block 04-3 covers an area of approximately 2600 km2. The Thien Ung field is including its 2 structural parts. Thien Ung structure discovery was made in 2004 with the 04-3-TU-1X well. Two subsequent appraisal wells (04.3-TU-2X and 04.3-TU-3X), drilled and tested respectively, delineated the field.

Location of Thien Ung field is shown in Figure 1.1 below.

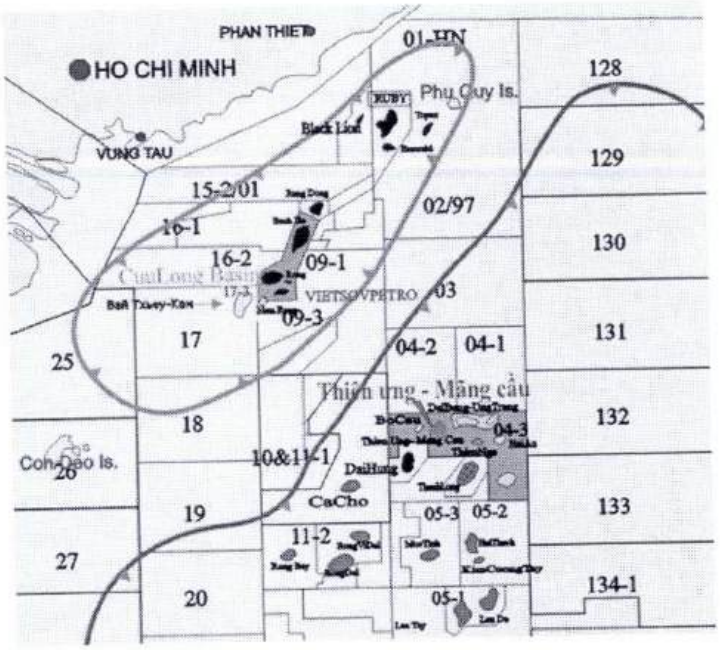

Figure 1.1: Thien Ung Reservoir Location

1.2 Purpose of document

This specification defines the minimum requirements for the design, engineering, procurement of materials, manufacture, painting, inspection testing, certification, transport protection, shipment, supply and delivery and commissioning of Manual Valves for installation and operation the BK-TNG Wellhead Platform.

This document shall be read in conjunction with all documents in reference list in section 1.4, to establish the minimum requirements for Manual Valves.

All parts, materials, components and the valves themselves shall be supplied to meet the design and environmental conditions stated in this specification (section 2.0) and shall be new and free from defects, fit for the purpose and not refurbished in any form

1.3 Definitions and Abbreviations

1.3.1 Definitions

PROJECT	Detail engineering service for BK-TNG Wellhead Platform
COMPANY	The party which initiates the project and ultimately pays for its design and construction and owns the facilities. Here the COMPANY is Vietsovpetro (Referred to as VSP)

VENDOR	The party on which the order or contract for supply of the equipment / package or services is placed
SUB-VENDOR	The person, group, or organization who may be employed by VENDOR to provide services for the design, manufacture, testing, and load-out / shipping of the Manual Valves, or to provide materials, subcomponents, and sub-assemblies for incorporation in Manual Valves

1.3.2 Abbreviations

BK-TNG	Thien Ung Wellhead Platform
VSP	Vietsovpetro
ASME	American Society of Mechanical Engineers
API	American Petroleum Institute
BS	British Standards
ISO	International Standardization Organization
MSS	Manufacturers Standardization Society
ASTM	American Society for Testing and Materials
NPS/DN	Nominal Pipe Size/ Nominal Diameter
NPT	National Pipe Thread
PWHT	Post Weld Heat Treatment
NDE	Non-Destructive Examination
CSO/LO	Car Seal Open/ Lock Open
Cr	Chrome
ENP	Electro Nickel Plated
OS & Y	Outside Screw and Yoke
PTFE	Poly Tetra Fluoro Ethylene
RB/ FB	Reduced Bore/ Full Bore
CS/ SS	Carbon Steel/ Stainless Steel

1.4 Reference Documents

The design of Manual Valves shall be in accordance with latest edition of, but not limited to, the documents and standards listed below including any applicable normative references:

1.4.1 International Code and standard:

ASME Standard:

Code	Title
ASME B1.20.1	Pipe Threads, General Purpose
ASME B16.5	Pipe Flanges and Flanged Fittings (NPS ½ Through NPS 24)
ASME B16.10	Face to Face and End to End Dimensions of Valves
ASME B16.20	Metallic Gaskets for Pipe Flanges - Ring Joint, Spiral Wound and Jacketed
ASME B16.25	Butt welding Ends
ASME B16.34	Valves - Flanged, Threaded and Welding End

Code	Title
ASME B16.47	Large Diameter Steel Flanges (NPS 26 Through NPS 60)
ASME B31.3	Process Piping
ASME Section V	Boiler and Pressure Vessel Code – Non Destructive Examination
ASME Section VIII	Boiler and Pressure Vessel Code Div I & II – Rule for Construction of Pressure Vessels
ASME Section IX	Welding and Brazing Qualifications

API Standard:

Code	Title
API RP14E	Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems
API RP 14J	Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities
API 6A	Specification for Wellhead & Christmas Tree Equipment
API 6D	Specification for Pipeline Valves
API 6FA	Specification for Fire Test for Valves
API 6FB	Specification for Fire Test for End Connections
API 598	Valve Inspection and Testing
API 570	Piping Inspection Code - Inspection, Repair, Alteration and Rerating of In-Service Piping Systems
API 594	Wafer and Wafer-Lug Check Valves
API 600	Steel Gate Valves, Flanged and Butt welding Ends
API 602	Steel Gate, Globe and Check Valves for sizes DN100 and smaller for Petroleum and Natural Gas Industries
API 607	Fire Test for Soft-Seated Quarter Turn Valves
API 609	Lug and Wafer Type Butterfly Valves

ASTM Standard:

Code	Title
ASTM A105	Standard Specification for Carbon Steel Forgings for piping application
ASTM A380	Standard Practice for Cleaning, Descaling and Passivation of Stainless Steel parts, equipment and systems

BS Standard:

Code	Title
BS 1873	Specification for Steel Globe Valves
BS 1868	Specification for steel check valves for the petroleum, petrochemical and allied industries
BS EN 12266-1	Industrial Valves – Testing of Valves. Pressure Tests, test procedures and acceptance criteria. Mandatory requirements
BS EN ISO 10204	Metallic Materials – Types of Inspection Documents

Code	Title
BS EN ISO 14313	Specification for Pipeline Valves
BS EN ISO 15761	Steel gate, globe & check valves for sizes DN100 and smaller, for the petroleum and natural gas industries
BS EN ISO 17292	Metal ball valves for the petroleum, petrochemical and allied industries
BS 6755	Testing of Valves (Parts 1 and 2)

ISO Standard:

Code	Title
ISO 5208	Industrial valves – Pressure testing of metallic valves
ISO 9001	Quality Management System
ISO 10497	Testing of Valves

MSS Standard:

Code	Title
MSS SP-25	Standard Marking System for Valves, Flanges, Fittings and Unions
MSS SP-44	Steel Pipeline Flanges
MSS SP-55	Quality Standard for Steel Castings for Valves, Flanges and Fittings and other Piping Components – Visual Method for Evaluation of Surface Irregularities.
MSS SP-61	Pressure Testing of Valves

1.4.2 Project Documents

Document No.	Title
BK.TNG-001-TS-PI-SP-001	Piping Material Specification
BK.TNG-001-GEN-AZ-SP-02	Painting Specification for Platform BK.TNG
BK.TNG-001-TS-PI-DS-002	Datasheets For Ball Valves
BK.TNG-001-TS-PI-DS-003	Data sheets for Globe Valves
BK.TNG-001-TS-PI-DS-004	Data sheets for Check Valves
BK.TNG-001-TS-PI-DS-005	Data sheets for Gate Valves
BK.TNG-001-TS-PI-DS-006	Data sheets for Butterfly Valves
BK.TNG-001-TS-PI-DS-007	Data sheets for Ball Double Block and Bleed Valves
BK.TNG-002-TS-PI-DS-008	Data sheets for Monoflange Valves

2

1.4.3 Order of Precedence

In the event of any conflict between this Specification, other project specifications, international codes and standards, the more stringent requirement shall apply.

1.5 Units and language

All units shall be expressed in SI (for ease of the users).

The VENDOR shall submit all documentation and correspondence in the English language.

2.0 ENVIRONMENTAL CONDITION

2.1 Temperature

Extreme High Temperature	39.0 Deg C
Extreme Low Temperature	21.0 Deg C
Average Annual Temperature	27.1 Deg C
Design Ambient Temperature	Maximum: 39 Deg C Minimum: 21 Dec C

2.2 Relative Humidity

Average Relative Humidity	78 to 84%
Design Relative Humidity	65 to 98%

2.3 Wind Speed

Maximum	34.2m/s (3 sec gust)
Design Wind Speed	34.2m/s

3.0 TECHNICAL REQUIREMENTS

3.1 General

All valves shall be designed for a minimum services life of 25 years

All valves shall be of the vendor's standard range with proven experience in an offshore gas production environment. Any recommended spare parts or required service facilities shall be readily available in Malaysia/ Vietnam.

Valve manufacturer's shall have a proven experience on offshore operation more than five years and should be in Company Approved Manufacturing List.

All valves and components shall be suitable for the service, operating conditions and offshore salt-laden marine environment.

Pressure/Temperature ratings of valves shall be as per ASME B16.34.

Unless specified otherwise, the face-to-face dimensions for valves shall be in accordance with ASME B16.10.

The minimum wall thickness of valve bodies and other pressure containing parts shall be sufficient for the appropriate piping class including corrosion allowances per respective piping class/valve data sheet. The wall thickness shall not be less than the minimum specified in ASME B16.34 or VENDOR shall prove by calculation to ASME Section VIII Div.1 (when applicable, see paragraph UG-101). Body wall thickness check report shall be required based on random check. All carbon steel valves bodies shall have a minimum corrosion allowance of 3 mm unless specified higher.

Valve body, trim, O-ring, elastomers, packing (stem) and bolting materials shall be suitable for the temperature ranges and services.

All valves shall be manufactured from casting or forgings. Plate fabrication is not permitted.

Forged bodies shall be forged close to final shape. Rolled and forged bar are not acceptable.

All flanged valves shall be cast or forged integrally with the valve body. Welded-on flanges are not permitted.

Weld repairs to valves are not permitted and shall not be allowed.

Flange surface finish shall be in accordance with ASME B16.5/ B16.47.

Valves shall be bi-directional unless valve construction specifically renders this impractical (e.g. globe, check and needle valves.) For uni-directional valves, an indicator showing flow direction shall be cast / forged into the valve body. For bi-directional valves, the valves shall be able to seal in both directions.

Valve position indicators shall be designed so as to prevent incorrect orientation on the valve assembly.

Valves shall be designed with a stem anti-blow-out device to prevent stem ejection by internal pressure when the stem packing and/or retainer have been removed.

Threaded connection to valves for vents, drains, injection on pin retention shall be protected by an O-ring or similar above and below the thread, and be secured by a locking ring or similar device. All crevices shall be avoided.

All wafer type valves in hydrocarbon service shall be lug or double flanged type to minimize bolt extension during fire.

Manual operators shall allow operation at the valve's rated pressure differential with a force no greater than 250N (with maximum lever length of 450 mm or maximum hand wheel diameter of 750mm). Valve operator shall be selected to meet this requirement.

All valves that maybe operated below -20°C shall be provided with an extended bonnet and be subject to a low temperature acceptance test. Minimum bonnet extension shall be as per table given below:

Valve Size DN	15 -25	40-50	80-100	150-200	250-300	350 & Above
Bonnet Extension (mm)	100	125	150	175	200	250

Where required for cold insulated service valve spindles shall be extended sufficiently to accommodate the insulation box.

Quarter turn valve handles shall be of the "lever lock" type and permanently fixed to the valve stem by a bolt or nut.

Levers and hand wheel on valves, including gear operators shall be permanently marked "OPEN" and/or "CLOSE" with an arrow to indicate the required direction of rotation. Gearbox shall be fitted with position indicators, have self-locking mechanisms and be fully sealed and protected to suit a salt-laden marine environment.

Valves shall be capable of satisfactory operation with valve stem in any orientation horizontal, vertical or inclined.

Where stated in the data sheet/requisition, valves shall be fitted with a facility for car seal locking in the full open or full closed position.

The design of all valves shall be such that self-closing of the valves due to vibrations, etc shall not occur.

Hard overlays, coatings or electro-nickel plating shall be used to provide wear/erosion resistance and to prevent galling of parts in sliding contact where deemed necessary. Differential hardness between valve seats and ball/disc/gate shall be maintained to prevent galling. There shall be no electro-nickel plating on the ball.

Where "MANUFACTURER's Standard" for materials have been specified, the VENDOR shall state the material offered/ supplied for review by COMPANY.

Valves of 100 kg and heavier shall be fitted with lifting lugs. Lifting lugs shall be cast or forged into the body or attached with full penetration welds.

Other requirement specific to each valve type, including fire safe design, fire tested design and fugitive emission leak test are described in the Attachments.

3.2 Lockable Valves

All isolation valves shall be able to be locked in either the open or closed position, by the use of a padlock. Special locking requirements will be noted on the Valve Data Sheets.

3.3 Operator drives

Unless otherwise specified in applicable data sheets, valves shall normally be operated by gear operator for cases specified in the table below.

For other sizes, valves shall be operated by standard lever and handwheel without gear box.

Manual Valve Type	ASME Class Rating	Gear Operator Requirement
Butterfly Valves	150#, 300# 600#, 900#, 1500#	Size DN 200 and over Size DN 100 and over
Gate Valves	150# 300#, 600# 900# 1500# & 2500#	Size DN 400 and over Size DN 300 and over Size DN 200 and over Size DN 150 and over
Ball Valves & Double Block and Bleed valves (ball type)	150#, 300# 600#, 900# 1500# & 2500#	Size DN 150 and over Size DN 100 and over Size DN 80 and over
Globe Valves	150#, 300#, 600#, 900# 1500#, 2500#	Size DN 200 and over Size DN 150 and over Size DN 80 and over

3.4 Ball Valves

1) Steel ball valves shall conform to API 6D for DN 50 and above, and BS EN ISO 17292 and for valves below DN 50.

2) All ball valves shall be of "FIRE SAFE" design and shall be fire tested and certified in accordance with API 6FA, API 6FB, API 607, ISO 10497 and BS EN 12266 and taking into account the additional requirements as specified in the valves data sheets.

3) Ball valve body may be of split body or all welded construction and shall be flanged end configuration. Split body configuration shall be utilised in size DN 600 and below to facilitate shop maintenance. Top entry valves maybe offered as an alternative but are unlikely to be commercially attractive. In-situ maintenance of top entry valves is not currently an option for COMPANY and this need not be used as a selection criteria.

Split body type with one or more bolted flanged joints and with flanged ends. Joint materials shall be approved by the COMPANY.

4) Unless otherwise specified, the floating and trunnion ball limitation shall be as follows:

DN (mm)	150#	300#	≥ 600#
15 to 40	Floating	Floating	Floating
50 to 80	Floating	Floating	Trunnion
100	Floating	Floating	Trunnion
150	Trunnion	Trunnion	Trunnion
200 to 900	Trunnion	Trunnion	Trunnion

5) Trunnion mounted ball valves shall have spring energized seats.

6) All valves shall be anti-static design.

7) All ball valves shall be provided with lugs/pin for lock open/close position purposes.

8) The ball shall be of a one-piece solid construction with a continuous through bore, welded-in liners are not acceptable.

9) Hollow balls are not allowed

10) Stems shall be anti blow-out design. Stem retention shall not depend on the packing gland.

11) All ball valves are required to provide automatic body cavity pressure relief to prevent over pressurisation.

12) Stem sealant injection shall be provided on ball valves with a body size DN50 and larger. Seal injection shall be provided for floating seat designs (trunnion mounted) with a ball size DN150 and larger. All sealant injection points shall incorporate a non return valve.

13) Non-metallic components for valves shall be suitable for use against design conditions specified on valve data sheets

14) All soft seated valves shall be suitable for a maximum design temperature of 200°C (392°F) and the co-incident pressure rating of ASME B16.34 for the specified body material. Vendor shall submit details with bid.

15) Reduced bore ball valves shall be of one step reduction only.

16) All ball valves shall be long pattern design with dimensions to ASME B16.10

17) Where API 6D is specified, for face to face std., normal pattern dimensions shall be followed (NOT the short pattern).

18) For full bore valves, minimum bore sizes shall be as per BS EN ISO 17292 specified for full bore valves.

3.5 Globe and Gate valves

1) Steel globe valves shall conform to the following standards, except where modified by this specification and/or valve data sheets:

   - BS EN ISO 15761 for sizes DN 15 through DN 40
   - BS1873 (Globe) and API 600 (Gate) for sizes DN 50 through DN 600.

2) Globe and Gate valves shall have rising stem & handwheel, outside screw and yoke, a bolt adjusted packing gland and bolted bonnet.
3) All Globe and Gate valves shall have back seats.
4) The stem and stem head shall be of a one piece design.
5) All seats shall be replaceable for valves ≥ DN80.
6) Gate valves size ≥ DN50 shall have flexible wedges . Solid wedges with reduced bore may be used for smaller sizes.
7) Screw-in seat rings shall be properly secured. Hard facing may be applied on either integral or separate seat rings.
8) Unless otherwise specified globe valves shall be regular bore with straight body and stem at right angles to the flow. A swivel type disc shall be provided.
9) The materials for stem packing shall be inherently fire safe, e.g. graphoil
10) Valves with screwed end connections shall be with threads as per NPT (female) to ASME B1.20.1.
11) Material of construction shall be in accordance valve data sheets
12) Globe and Gate valves flanged end design shall be as per ASME B16.5/ B16.47 Type B
13) Inspection & testing shall be in accordance with ASME B16.34/API 598 / API 6D

3.6 Check valves

1) Steel check valves shall conform to the following standards except where modified by this specification and/or valve data sheet:
    - BS EN ISO 15761 for Check Valves (piston type) sizes DN 15 through DN 40.
    - API 594 for Wafer Check Valves DN 50 and larger or
    - BS1868 for Swing Check Valves DN 50 and larger
2) All check valves shall be suitable for horizontal as well as vertical installation (swing check valves suitable for installation in horizontal and in vertical with flow upwards).
3) All wafer check valves shall be of "Retainerless design".
4) Piston or ball type check valves shall be spring assisted except for use in clean service. Unless specified otherwise, piston or ball check valves shall be full port.
5) Small check valves (DN15 to DN40) are normally of piston type and shall be used only in horizontal pipes.
6) Check valves shall be of "FIRE SAFE" design and shall be fire tested and certified in accordance with API 6FA, API 6FB, API 607, ISO 10497 and BS EN 12266 and taking into account the additional requirements as specified in the valves data sheets.
7) Material of construction shall be in accordance with valve data sheets
8) End connection shall flange type.
9) Inspection & testing shall be in accordance with ASME B16.34/API 598 / API 6D

3.7 Monoflange Valves and Double Block and bleed valves

1) All valves shall be of "FIRE SAFE" design an shall be fire tested and certified in accordance with API 6FA, API 6FB, API 607, ISO 10497 and BS EN 12266, as specified in valves datasheets.
2) Valve construction shall be of one integral unit with one or two block valves and shall be designed as per VENDOR standard.
3) All valves shall be anti-static design.
4) Ball shall be of a one-piece solid construction with a continuous through bore, welded-in liners are not acceptable.
5) Stems shall be anti blow-out design. Stem retention shall not depend on the packing gland.
6) Non-metallic components for valves shall be suitable for use against design conditions specified on valve data sheets
7) All soft seated valves shall be suitable for pressure rating of ASME B16.34 for the specified body material. Vendor shall submit the details with the bid.
8) The valve body shall be of bolted construction and fully dis-mantable type.
9) Needle valve shall be of back seat, bolted bonnet design.
10) An integral ball / stem design for seat supported (floating) ball is not acceptable.
11) For Full bore valves, minimum bore sizes shall be as per BS EN ISO 17292 specified for full bore valves.
12) Inspection & testing shall be in accordance with ASME B16.34/ API 598 / API 6D

3.8 Butterfly valves

1) Butterfly Valves shall conform to API 609 Category A for sizes DN 50 through DN 600 and in general for larger sizes, except where modified by these specifications and/or valve data sheet.
2) Lugged valves shall be through drilled, with hole diameters to suit ASME B16.5 flanges.
3) Multi-position "locking lever" of the notched plate design to allow positive positioning in a maximum number of intermediate positions are to be used where gear operators are not employed (soft seated valves only).
4) Valves are to be suitable for installation with the operating shaft in the horizontal plane.
5) Valve stem packing shall be adjustable by means of an external gland.
6) In case of gear operated valves, it should be possible to hold the valve disc in any intermediate position under all operating conditions. Gear operators shall be self locking.
7) All valves shall be equipped with adjustable mechanical stop limiting devices to prevent over travel of the valve disc in Open and Closed position.
8) All butterfly valves, both lever and gear operated, shall be supplied with a locking device suitable for a heavy duty padlock to prevent operation in the locked position.
9) Valves shall be bi-directional.
10) Material of Construction shall be as per valve data sheets.
11) Inspection & testing shall be in accordance with ASME B16.34/ API 598 / API 6D

4.0 MATERIALS REQUIREMENTS

The valve material listed in the piping classes are given as nominal minimum requirement. In each case the valve manufacturer shall be responsible for selecting a full range of materials and trim with previous proven experience under similar operating fluids and conditions.

For valves intended for low temperature service, they shall be impact tested as per ASME B31.3 chapter III, Table 323.2.2.

All materials of construction shall conform to the applicable ASTM / ASME / API specification, valve data sheet and relevant piping classes.

All materials shall be new, not refurbished and the exterior surface shall be free of dirt, sand, debris and rust.

Unless otherwise specified, heat treatment shall be in accordance with applicable material standards.

Components of all product forms shall be hardness tested.

Use of Asbestos is forbidden in any parts of the valves.

Soft seated ball valves shall only be used within pressure/temperature range of soft seat material, as specified on the valve datasheets.

All stainless steel parts shall be pickled and passivated as per ASTM A380. Materials of construction of stainless steel valves and accessories shall be made from forged materials.

Machined surfaces may be passivated only

- Forged carbon steel material to ASTM A105 shall be normalized.
- Carbon content for carbon steel forgings shall be limited to 0.35 % max.

All internal springs shall be Inconel X750 (UNS N07750) unless stated otherwise.

For detail of material requirements, refer to section 3.0 of Doc. No. "BK.TNG-001-TS-PI-SP-001 Piping material specification"

For Positive Material Identification (PMI), refer to section 4.0 of Doc. No. "BK.TNG-001-TS-PI-SP-001 Piping material specification"

5.0 QUALITY ASSURANCE, QUALITY CONTROL INSPECTION & TESTING

5.1 Quality Assurance / Quality Control

5.1.1 General

The VENDOR and their SUB-VENDOR's shall have an established and documented Quality System in accordance with ISO 9001. No procurement of materials, fabrication, manufacture or assembly shall begin until all necessary drawings and design documents have been reviewed by the COMPANY and are at Approved for Construction (AFC) status, required procedures, quality plan and ITP have been approved by the COMPANY, all statutory requirements have been complied with and the Pre-Inspection Meeting (PIM) has been held at VENDOR's main manufacturing facility.

The COMPANY'S representative and Third party Inspector shall have access and right of review all records, reports, certificates, etc., connected or concerned in any manner with the manufacture of Manual Valves included in Purchase Order(s). They shall have the right to inspect

and/or witness at anytime the VENDOR'S activities and/or operations in connection with this specification and to respect any work, material, or procedure deemed defective or sub-standard.

VENDOR shall notify the COMPANY of the scheduled dates at the test / inspection in advance as per Purchase Order(s) or as follows:

- Fourteen (14) working days prior to start of manufacture, FAT key production / inspection / testing as per ITP, codes and standards and final inspection.
- Seven (7) working days to any other inspection or test.

VENDOR is responsible for all QA/QC services required to ensure strict compliance with the requirements of this Specification.

The test fluid for hydrostatic testing shall be hydraulic oil or an emulsion of water with a water soluble oil to prevent rust. The chloride content of the test fluid shall not be exceed 30ppm.

For valves to API Spec. 6D, manufacturer shall provide proof of valid API Spec 6D Monogram along with the quotation. The manufacturer's quality assurance shall be verified to comply with the requirements of API Spec Q1.

For valves to API Spec. 6A, manufacturer shall provide proof of valid API Spec 6A Monogram along with the quotation. The manufacturer's quality assurance shall be verified to comply with the requirements given in respective valve data sheet.

5.1.2 Certification

A complete Material Test Report (MTR) showing results of all chemistry and physical tests shall be provided for all valves. The material and test certificates shall be in accordance with BS EN ISO 10204, and as a minimum shall include:

- Chemical Analysis by Heat
- Mechanical properties
- Heat Treatment statement and Number
- Non Destructive Examination (NDE) results
- Hydrostatic and/or Pneumatic Test results
- Heat or Batch Number

All certificates shall state the Valve Manufacturer's name and location, all forging and casting certificates shall be from original forge or foundry. Certificates shall include the VENDOR's purchase order number and purchase order item number.

5.2 Testing and Inspection

Inspection & Testing shall be performed in accordance with ASME B16.34 & API 598 for each valve as listed in valve data sheet.

As minimum, the following production tests shall be performed:

- 100% visual inspection
- Random thickness tests on all components
- Hardness tests on all components
- Tests for porosities, cracks & similar defects (outside & inside valve surfaces)

- Hydrotest
- Fugitive emission test (optional)

The Manual Valves shall be assembled, dimensionally checked and functionally tested onshore to avoid installation work at offshore on BK-TNG.

Unless specified otherwise, all inspection and testing shall be carried out as per applicable Code & Standards and requirements specified below:

5.2.1 Pressure Testing

a) Each valve shall be pressure tested as per applicable standard and the requirement specified in Table 5.1 below:

TABLE 5.1 – Valve Pressure Test

Valve Type	Hydrotest Body (1.5 x Design Pressure)	Hydrotest Seat (1.1 x Design Pressure)	Hydrotest Backseat (1.1 x Design Pressure)	Pneumatic Test Seat (600 kPa)
Ball and Monoflange	100%	100%	Not Applicable	100%
Gate	100%	100%	100%	100%
Globe/Needle	100%	100%	100%	100%
Check	100%	100%	Not Applicable	100%
Butterfly	100%	100%	Not Applicable	100%

Note: Design pressure is the Maximum Allowable pressure of applicable Piping Class, at room temperature.

b) Pressure test Certificates shall be produced in accordance with section 3.1 of this specification.

c) All valves shall be subject to hydrostatic seat leakage testing. Allowable seat leakage rates shall be as per Table 5.2 unless stated otherwise, for each valve type or in datasheet.

TABLE 5.2 – Valve Leakage Rate

Valve Type	Valve Seat Type	Leakage Rate Reference
Ball and Double Block & Bleed	Soft Seated	API 598 (For Valves to BS EN ISO 17292) ISO 5208 (For Valves to BS EN ISO 14313)
	Metal Seated	API 598 (For Valves to BS EN ISO 17292) ISO 5208 (For Valves to BS EN ISO 14313)
Check	Soft Seated	No visible leakage
	Metal Seated	API 598
Gate	Soft Seated	No visible leakage
	Metal Seated	API 598 / ISO 5208
Globe	Metal Seated	ASME B16.34
Butterfly	Soft Seated	No visible leakage

a) Valves that requires zero leakage (tight shut-off or TSO) shall comply with seat leakage rates A or B according to ISO 5208 and BS EN 12266-1 (replacement of BS 6755-1), or to class V or VI in accordance with IEC 60534-4.

5.2.2 Non-Destructive Examination (NDE)

Valve bodies and bonnets shall be subjected to all NDE requirements specified in applicable standards and codes and as described in Table 5.3 and Table 5.4.

TABLE 5.3 – Non Destructive Examination Requirements

Material	ASME Class Rating	Manufacturing Method	Visual Inspection	Radiography /Ultrasonic Inspection	Magnetic Particle / Dye Penetrant Inspection
All	150# to 1500#	Forging	100%	N/A	10%
CS / SS	150# to 300#	Casting	100%	10%	10%
CS / SS	600# and above	Casting	100%	100%	100%

Testing to be carried on the percentage of casting quantity shown above, with a minimum of one.

TABLE 5.4 – Non Destructive Examination Standards

NDE Method	Manufacturing Method	Standard and Acceptable Criteria
Visual	Casting	MSS SP 55
	Forging	ASME Section V Article 9
Radiography	Casting	ASME B 16.34 Annex B
Ultrasonics	Casting	ASME B 16.34 Annex E
Magnetic Particle	Casting	ASME B 16.34 Annex C
Liquid Penetrant	Casting	ASME B 16.34 Annex C

a) All prototype casting shall have been subjected to 100% volumetric examination in accordance with ASME B16.34 Section 8.0.

b) Radiography shall be carried out on critical area as defined by ASME B16.34

c) Magnetic particle inspection or dye penetrant inspection shall be carried out all accessible interior and exterior surfaces, including machined surfaces.

d) Where radiographic inspection is not feasible, ultrasonic examination of castings may be carried out after specific approval has been obtained from the COMPANY in writing.

e) Valves made of SS and Duplex SS shall be subjected to 100% NDE & shall be witnessed by Third Party Inspector.

f) Should any component fail any in inspection requirement and/or cause delays to production schedule, COMPANY shall be informed so that detailed assessment of defects may be made.

g) Defect removal & repair shall be in accordance with ASME B16.34. Surface defects may be removed by grinding provided that a Max. of 10% of wall thickness removed is not exceeded; in no case shall the pressure design thickness be reduced.

h) Repair by peening is not allowed. Weld repair shall not be allowed.

i) The air used for test shall be clean instrument air; secondary sealing system shall not be used.

6.0 PROTECTIVE COATINGS

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All surfaces shall be prepared, coated and painted in accordance with BK.TNG-001-GEN-AZ-SP-02, Painting Specification for Platform BK.TNG, unless otherwise specified.

Non-ferrous metal surface, galvanised surfaces, plastic and stainless steel surface shall not be painted, unless specified otherwise

Damage to painting while in transit shall be the responsibility of the VENDOR. The VENDOR shall include sufficient color matching for this purpose and for any minor damage during manufacturing

7.0 MARKING

Each Valve shall be permanently marked in accordance with the following requirements:

- Marking on valve body shall be as per respective MSS SP-25, Standard Marking System for Valves, Fittings, Flanges and Unions
- Body marking shall be integral with the body or on a plate securely fixed to the body. Location of marking plate shall be clearly visible and readable from a reasonable distance.

Each valve shall have a permanently attached nameplate as per applicable industry standard. The Valve nameplate shall be manufactured from SS316 plate of 3mm thickness.

As a minimum, the nameplate shall contain the following information, and shall be in English language:

- Model or Type designation
- Valve Tag No.
- Weight of Valve
- Nominal valve size
- ASME Class Rating
- Body material designation and trim identification
- Arrow to indicate direction of flow (unidirectional flow only)
- PO number and PO item number
- MANUFACTURER's name of trade mark and model number
- Date of Manufacture

VENDOR shall submit the nameplate data and drawing for COMPANY'S review & approval.

Wiring & spot welding are not acceptable methods of permanently attaching nameplates

8.0 SPARE PARTS & SPECIAL TOOLS

VENDOR shall provide itemized quotes in the bid proposal for and supply the following spares and special tools, as minimum:

- Spare parts for pre-commissioning / commissioning and start-up
- Recommended spares for 2 years normal operation (provide itemized price list only)
- Insurance spares (if required)
- Special tools for operation, removal, installation, maintenance.

All spare parts & special tools furnished by VENDOR shall be wrapped & packed to preserve items as new condition under normal storage anticipated in Vietnam. The spare parts shall be properly tagged with weatherproof stainless steel tags.

Packing shall be sealed against ingress of water and dust and vermin proof for a period of six (6) months from shipment date.

All items supplied shall be packed separately and clearly marked as 'Spare Parts' or 'Special Tools' and shipped with Manual Valves in accordance with instructions from COMPANY.

Packing list shall be furnished complete and in detail. Photographs of items before and after packing shall be provided for ease of identification at onshore fabrication yard.

9.0 PREPARATION FOR SHIPMENT

The VENDOR shall be responsible for preparation for shipment including: Packing, protection, preservation, labeling and marking of all valves.

The valves shall be as much as possible, shipped fully assembled together with gear operator so that they require no further disassembly / reassembly upon arrival. If dispatched in pieces, VENDOR shall submit procedure of assembling for COMPANY's information.

Provision for 12 months outdoor storage in tropical, marine, salt-laden offshore conditions shall be provided.

VENDOR shall provide full details on the preservation method and any scheduled maintenance requirements during the year.

All machined surfaces and threaded connections shall be protected with an easily removable anti-corrosion compound.

All flange openings shall be protected from sand, dirt & moisture with plug or steel/wooden plates to provide adequate protection and shall be attached by proper bolting.

Screwed connections shall be protected with hex headed forged steel plugs.

Any item of the valves that is subject to distortion/damage during transportation and erection shall be provided with suitable brace or dismantled and properly packed for shipment.

All valves shall have grease injected for water resistance & corrosion inhibition

Ball valve shall be in open position.

Spare parts as agreed with COMPANY shall be shipped with each Valve in separate packing.

Subject to COMPANY's inspection, all items shall be packed in sea-worthy crates or boxes.

A detail packing list shall be prepared for each case and attached therein in a waterproof plastic sleeve.

The data to be recorded on each packing list and shall contain the following as minimum:

- Name and Address of Manufacturer

- Purchase Order Number
- Case Identification Number
- Overall Dimensions in metre
- Gross weight of the case
- Itemised List of the contents
- Any other relevant information.

Valves shall be delivered to the designated location as per Purchase Order, complete with all certification and Quality Assurance documents.

Final Operation, Installation and Commissioning manual shall be submitted at least six weeks prior to the delivery of Manual Valves

10.0 GUARANTEES & WARRANTY

10.1 General

VENDOR shall warrant and guarantee:

- Complete, operationally efficient and reliable Manual Valves which are able to handle all start-up, shut-down, operating, malfunctioning and standstill situations as well as hazards arising from the operation of the valves, and which represents the most up-to-date state of the art at the time when the order is placed. All details must be optimally matched to one another in functional and commercial terms and together must constitute a single unit.
- The quality and suitability of the delivery in terms of materials, construction, machining, fabrication and configuration
- Both the individual parts and the overall extent of its delivery meet the appropriate statutory and official regulations and also accident protection and accident prevention regulations.
- The operational completeness, even if parts within the established limits of the scope of delivery and necessary for completeness are not expressly itemized in the PO.
- Technical data for the component.

VENDOR shall, if required, supply the services of experienced engineers to supervise the correction of any defects found during the guarantee period. VENDOR shall also guarantee all work, materials and equipment furnished by any sub-VENDOR and which is incorporated in the Manual Valves. VENDOR shall have final and total responsibility for the design and performance of the valves furnished by him.

10.2 Performance Guarantee

VENDOR shall have the single point final and total responsibility for all aspects of the works, inclusive of all components sub-contracted or purchased from others, for the performance of the valves and its associated components supplied under this specification and datasheet.

10.3 Process Guarantee

Where process design is part of the scope of work the VENDOR shall guarantee the complete Manual Valves shall meet the performance requirements stated in the data sheet at agreed guarantee points and including any turndown specified.

10.4 Mechanical Guarantee

VENDOR shall provide a Mechanical Guarantee for the complete Manual Valves meeting the mechanical design requirements stated in the data sheet, specifications and Code and standards.

10.5 Warranty

VENDOR shall provide warranty for the complete Manual Valves and materials for a period of 12 months from successful commissioning of Manual Valves or 18 months from delivery of last portion of material or part, whichever occurs first. Warranty shall cover both the supply of material and manpower to replace or make good any defective component/equipment offshore.

10.6 Replacement Goods

The VENDOR shall replace and install without cost to the COMPANY any materials, supplies or valves that fail under design or test condition due to defects in material or workmanship provided the defect is reported within the warranty period at no additional cost to COMPANY.

Acceptance of any purchase order shall signify acceptance of all conditions of this guarantee. VENDOR shall upon notice from COMPANY, make good at his own expense all defects found during the warranty period expeditiously.

RESEARCH AND ENGINEERING INSTITUTE
FOR OFFSHORE OIL AND GAS

AGREED BY
Deputy General Director of Vietsovpetro

Tran Xuan Hoang

05 / 11 /2021

APPROVED BY
Chief Engineer of Vietsovpetro

Tran Van Vinh

04 / 11 /2021

TYPICAL ENGINEERING DOCUMENTATION

DOCUMENT TITLE : **SPECIFICATION FOR PIPE SUPPORTS**

DOCUMENT No. : **VSP-NIPI-TYP-TS-PI1-SP-06**

AGREED:	**Name**	**Date**
Capital Construction Department	Signed by: Nguyễn Hồng Giang Date: 02/11/2021 20:04:23 Certified by: Vietsovpetro CA	
Offshore Construction Division	Signed by: Phạm Thanh Bình Date: 02/11/2021 16:41:31 Certified by: Vietsovpetro CA	

REV.	DESCRIPTION	DATE	PREPARED	CHECKED	CHIEF DEPART.	ENG. MANAGER	PRO. MANAGER
		Signed by: Lương Thuỳ Dương Date: 01/11/2021 11:11:21 Certified by: Vietsovpetro CA	Signed by: Nguyễn Công Trình Date: 01/11/2021 14:43:39 Certified by: Vietsovpetro CA		Signed by: Trần Duy Hải Date: 02/11/2021 09:16:29 Certified by: Vietsovpetro CA	Signed by: Bùi Trọng Hân Date: 02/11/2021 13:55:47 Certified by: Vietsovpetro CA	
0	IFA	30/10/2021	L.T.DUONG	L.T.DUONG	N.C.TRINH	T.D.HAI	B.T.HAN

Change Log

REV	SECTION	PAGE	CHANGE DESCRIPTION

Reference Documents

VSP-NIPI-TYP-TS-PI1-DB-01	PIPING AND LAYOUT DESIGN BASIS
VSP-NIPI-TYP-TS-PI1-DB-02	PIPE STRESS ANALYSIS DESIGN BASIS
VSP-NIPI-TYP-TS-PI1-SP-05	SPECIFICATION FOR PIPING FABRICATION, INSTALLATION, INSPECTION & TESTING
VSP-NIPI-TYP-TS-PI1-GEN-01	PIPE SUPPORT STANDARD
VSP-NIPI-TYP-TS-PI1-DS-100	DATASHEET FOR U-BOLT SUPPORT
VSP-NIPI-TYP-GEN-AC7-SP-01	PAINTING SPECIFICATION FOR PLATFORM
VSP-NIPI-TYP-GEN-AC7-SCH-01	BASIC PAINTING SCHEDULE FOR PLATFORM
VSP-NIPI-TYP-GE-AC7-SP-03	SPECIFICATION FOR COMPOSITE COATING
VSP-NIPI-TYP-GE-ST3-DW-01	TYPICAL STANDARD DETAILS – GENERAL NOTE
VSP-NIPI-TYP-GE-ST3-DW-02	TYPICAL STANDARD DETAILS – WELDING PROFILES
VSP-NIPI-TYP-GE-ST3-DW-03	TYPICAL STANDARD DETAILS – BEAM CONNECTIONS

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1.0 GENERAL

1.1 INTRODUCTION

The typical engineering documentation is a set of engineering documents issued by Research and Engineering Institute (REI) that can be applied repeatly to many projects that REI involves.

The typical engineering documentation shall be agreed by related departments in Vietsovpetro and approved by Vietsovpetro, if any.

1.2 PURPOSE

The purpose of this document is to define basic input data, documentation and the requirements for the design, material supply and fabrication of pipe supports for piping systems to be used for Vietsovpetro's oil and gas projects.

All piping systems shall be evaluated and analyzed for adequate supports concept and definition in accordance with applicable codes and standards, and suppliers' recommendations as applicable

1.3 DEFINITION AND ABBREVIATION

The following terms as used in this specification, assume the meanings given below:

COMPANY	The party which initiates the project and ultimately pays for its design and construction and owns the facilities. Here the COMPANY is Vietsovpetro (Referred to as VSP)
VENDOR/ SUPPLIER	The party on which the order or contract for supply of the equipment / package/ piping material or services is placed
CONTRACTOR	Any party who is responsible for and/or performs fabrication, erection, assembly, installation, inspection and testing of piping system.
SUB CONTRACTOR	The entity engaged by the CONTRACTOR and approved by the COMPANY to perform any activity under the CONTRACTOR's scope of work.
WORK	The goods and services provided to the COMPANY by the CONTRACTOR, SUB CONTRACTOR or VENDOR

The following definitions refer to abbreviations used throughout this document:

DN	Nominal Diameter
EJMA	Standards of the expansion joint manufacturers association
FEED	Front-end engineering design
OD	Outside Diameter
PTFE	Poly Tetra Fluoro Ethylene
WRC	Welding Research Council

1.4 APPLICABLE CODES, STANDARDS

As a minimum, all equipment supplied as part of this package shall be designed, manufactured, tested and delivered in accordance with the relevant sections of the latest National/International Codes, Standards and Regulations listed below.

Code	Title
ASME B31.3	Process Piping
MSS SP-58	Pipe Hangers and Supports - Material, Design and Manufacture
MSS SP-69	Pipe Hangers and Supports - Selection and Application
MSS SP-89	Pipe Hangers and Supports - Fabrication and Installation Practice
ASTM	American Society for Testing Materials
BS 3974	Specification for Pipe Supports
EN 10204	Metallic products - Types of Inspection Documents

1.5 CONFLICTS

CONTRACTOR / VENDOR shall be advise COMPANY of conflicts between the specification, datasheets and the referenced codes and standards. In case of any conflict, the most stringent requirements shall apply.

1.6 LANGUAGE AND UNIT

All documents shall be in the English language.

All units shall be expressed in the Metric System of Measurement (SI units).

All piping sizes shall be expressed by inch.

2.0 GENERAL REQUIREMENTS

The layout and design of piping and its supporting elements shall meet the requirements of ASME B31.3, MSS SP-58 and MSS-SP-69.

Piping shall be supported, guided and anchored to limit the sagging of pipe up to 6mm between the supports. Exceptions to this shall be approved by stress engineer. All pipe supports, shall be placed as near as practicable to both lateral and vertical changes in pipe direction without interfering with operation and maintenance. Piping and equipment shall be protected from excessive loading and expansion stresses.

Piping supports and special supports assembly (spring supports, sliding plates, rigid struts, etc.) shall be designed for any load combination, including hydrostatic test loads, transient loads developed during testing, commissioning, operation, shutdown and transportation. Design of structures anchoring more than one line shall accommodate the most stringent combination of forces and moments acting concurrently.

Due consideration shall be given for supporting of small bore heavy / bulky appendages to piping (e.g. pressure gauges, orifice flange valves, sample point, etc.) on non-critical lines.

Wherever possible, piping connected to valves with reversible blinds and mechanical equipment, such as pumps, requiring periodic maintenance shall be supported so that the valves and equipment can be removed with a minimum of temporary supports and with allowable space requirement. Unless specified by stress, the upstream side of the control valve set piping arrangement shall be provided with two-way lateral guide and the downstream side shall be guided.

When required by the lead stress engineer adjustable pipe supports shall be employed adjacent to machinery nozzles (e.g. Pumps, Turbines, Compressors) to assist in alignment to the equipment nozzles.

Local compressive stresses in large pipes or thin-walled pipes shall be taken into account, using where necessary suitable welded protection shield / pipe saddle (Refer to Drawing No. VSP-NIPI-TYP-TS-PI1-GEN-01_Pipe support standard).

Local stresses at welded attachment in pipes shall be checked in accordance with WRC 107 where the calculated loads exceed the allowable loads for the Standard pipe Supports and for all Special Welded Supports.

3.0 SUPPORT DESIGN

3.1 GENERAL

Pipe support tagging shall be indicated in Isometrics for all pipe sizes.

All pipe clips, pads and gussets on vessels shall be defined when required at study phase (Basic Design phase or FEED phase) regardless of line diameter.

Structural pipe support steel members shall be attached with a doubler plate to primary structural column, beams and circular bracings.

When a temporary support is required during hydrostatic test or during transient operation, when spools are removed or during transportation, it shall be clearly specified in isometric or pipe support index so that it will be removed after testing. Temporary supports are painted with unique colours so that they can be easily identified and removed prior to commissioning.

All supports shall be designed and fabricated considering the pipe or structure movement to prevent from disengagement.

Where ever possible all supports at floor penetrations shall be located below the steelwork of the platform to avoid obstructions.

Pipes should be supported in groups at a common support elevation of the supporting structure. All pipes shall be routed in such a way that will simplify supporting method (design and construction) of each line by:

- Defining common structures for pipe ways and cable trays
- Defining secondary routes for pipes and cable trays around equipment and inside equipment structures

Field welding of pipe supports to piping shall be kept to a minimum. Structural provisions to connect pipe supports shall be made as much as possible during the design phase (e.g. inserts, brackets to steel structure, etc.). Welded guides and other welded support elements in hot dip galvanized or passive fire protection coated steel structures (e.g. pipe racks/ bridges / steel wall / frame / column) shall be attached to steel members before they are hot dipped galvanized or coated with passive fire protection.

Welded attachments (lugs, cleats, etc.) to piping systems for use as pipe supports shall not be used, unless approved by COMPANY. Welded supports on elbows shall be minimized in order to avoid over stress at elbow junction.

To prevent galvanic corrosion, carbon steel clamps on pipes of other metallic materials shall be separated from pipes by using synthetic rubber, glass fiber paper tape (composite) or other insulating material between the clamp and the pipe (Refer to Drawing No. VSP-NIPI-TYP-TS-PI1-GEN-01_Pipe support standard).

U-bolts shall be Hot-Dip Galvanize, or Sermagard, or Xylan Fluorocarbon or PTFE coating or equivalent approved by COMPANY. All nuts shall be heavy hex and drilled oversize for the Xylan Fluorocarbon or PTFE coating or equivalent approved by COMPANY. All U-bolts shall be neoprene or Polyshrink insulated to protect the paint system during installation for all piping systems (Refer to Drawing No. VSP-NIPI-TYP-TS-PI1-DS-100_Datasheet for U-bolt support).

U-bolts shall not be used as full anchors. U-bolts are not to be tightened against the top of pipe, minimum 1mm clearance should be maintained.

Suspending a pipe from another pipe shall be strictly avoided. Rod hangers shall be used only when resting supports are not feasible and according to stress analysis recommendation to reduce friction loads. Rod length shall allow any horizontal displacement with a maximum angular movement of 4° from neutral position.

The locations of the supports shall allow for the removal of in-line instrument and equipment.

Guide Supports located near the expansion loop of the two phase process flow lines subject to pulsating flow shall preferably be of the goal post type.

Pipe Supports shall be located as close as possible in pipe change direction, but shall allow adequate flexibility to the line concerned.

Spring supports and Rigid Struts shall be permanently accessible.

Spring base or hanger cleats shall be continuously welded to the steel structure.

Supports in lines with expansion joints shall be designed and positioned in accordance with the manufacturer requirement or EJMA standard.

Cold supports shall be isolated by means of laminated hard wooden blocks or high-density polyurethane blocks.

Lines with slope shall be generally supported on pipe shoes.

Support components if welded to the pipe and fabricated from pipe (such as protection shield, trunnions, stanchions and dummy legs) shall be of the same material as the line. The Bill of Materials shall be included in the pipe Bill of Materials.

Welded-on support attachments, such as saddles, pipe shoes, pipe stanchions, pipe dummies, trunnions and lugs, if used for any reason, shall not be attached to pipe tees, reducers and elbows. Only in unavoidable situations and permitted by stress engineer, pipe stanchions, pipe dummies and lugs may be attached to elbows.

3.2 INSULATED LINES IN HOT SERVICE

All insulated diameter DN25 and above lines shall be installed on welded shoes, except for lines insulated for personnel protection.

Insulated lines diameter DN20 and below, operating at temperature above 0°C shall have a cut away insulation at pipe supports location so that pipes rest directly on steel supports with isolator pad. Sufficient clearance shall be provided to allow pipe movement.

Saddles and pipe shoes of lines operating at temperature above 400°C shall be isolated from the supporting structure by incombustible insulating blocks of sufficient load bearing and insulating capabilities.

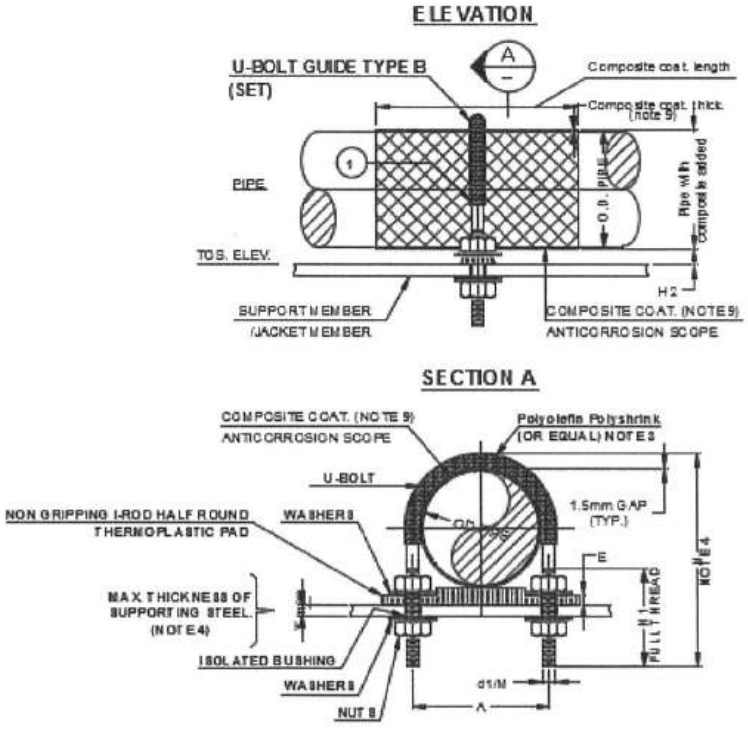
3.3 UNINSULATED LINES

- Uninsulated lines shall rest directly on the supporting structure with isolator pad. However, saddles or shoes shall be considered for the following cases:

- The line operating temperature is below ambient temperature, and therefore experiencing surface condensation. (access will be needed for painting and repair)
- Blowdown lines (lines that operate at such a low temperature of -10°C and below that they may cause embrittlement of the supporting member).
- Lines with sliding plates.
- Carbon steel pipes with thickness less than schedule 20 & Stainless steel pipes with thickness less than schedule 10S
- Pipes DN650 and above.
- High support loads requiring reinforcement pad with saddles.

- Uninsulated lines with U-bolt support with maximum operating temperature 80°C: for protection pipes from corrosion at the supports, composite coating shall be added with length depending on outside diameter of pipe, and specified as below:
  - For the pipes which have O.D. from 2" to 6": length of composite coating shall be min. 200mm.
  - For the pipes which have O.D. above 6": length of composite coating shall be min. 300mm.
  - In some special cases (not enough spacing), the composite length may be min. 100mm

Figure 1: Typical composite coating with U-bolt support
(For more details referred to Pipe Support Standard VSP-NIPI-TYP-TS-PI1-GEN-01)



3.4 EXTENT OF SUPPORT DESIGN AND DELIVERABLES

The locations and type of support shall be shown on isometric drawings for all lines.

For lines below DN50, the support details shall be verified by Contractor/Sub Contractor at site.

The deliverables required for construction of pipe supports are:

- Isometric drawings
- Pipe Support detailed drawings of Structural Group
- Requisitions for Itemized Materials

3.5 PIPING CONSTRUCTION SUB-CONTRACTOR'S RESPONSIBILITY

The Contractor/Sub Contractor shall supply, fabricate and erect all pipe supports, structural steel and attachments to pipe work required in accordance with the standards and drawings supplied.

The Contractor/Sub Contractor shall fabricate and install the pipe supports in accordance with Structural Piping Support drawings and Isometrics.

The Contractor/Sub Contractor shall support on-site and supply support materials for small bore lines below diameter DN50 (unless stress critical as identified on critical line list). See also Section 3.4.

The Contractor/Sub Contractor shall be responsible for the supply, erection and removal of any temporary pipe supports required for fabrication, erection and hydro test of pipe work.

Itemised materials or tagged items for pipe supports (eg. Springs, Rigid struts & Rod hangers, Sliding plates) shall be supplied by the COMPANY as per datasheet.

4.0 SUPPORT CLASSIFICATION

4.1 PRIMARY PIPE SUPPORTS

Primary supports are directly welded to the pipe i.e. protection shield, pipe shoe and pivot and guided by U-bolt or clamps.

4.2 SECONDARY SUPPORTS

Secondary supports is required specific details and using structural shapes material.

5.0 ITEMISED MATERIAL (VENDOR SUPPLIED}

Itemised materials or tagged items for supports shall include the following:

- Variable and Constant Spring Supports & Hangers
- Rod Hangers
- Rigid Struts
- Sliding Plates

Tagged items are specified based on information in Stress Calculation Notes and Datasheet.

6.0 GUIDELINES FOR PIPE SUPPORT SELECTIONS

6.1 CARBON STEEL / LOW TEMP. CARBON STEEL / STAINLESS LINES

Lines with or without Stress Relieving shall be supported as follows:

Un-insulated or insulated for personnel protection lines, shall be directly resting on structural steel with pipe composite coating and half round I-rod between pipe and steel or not. To reduce local stresses, a protection shield for DN450 and above lines shall be provided to the main pipe for better load distribution.

Insulated lines or lines with slope, shall be on welded pipes shoes. If clamped shoes are used, on line stops and anchors, thrust stops / carrier plates of same material as pipe, shall be indicated on isometrics and welded at site.

Welded attachments like lugs and cleats shall be avoided. Similarly supports on elbows shall be avoided.

On line stops and anchors and whenever required due to high loads, a protection shield (same as parent pipe material) shall be shop welded in prefabrication and it shall be specified on isometrics.

6.2 GALVANIZED LINES

Uninsulated or insulated for personnel protection lines, shall be directly resting on steel with pipe composite coating and half round I-rod between pipe and steel or not. Lines with slope, shall be on clamped pipes shoes.

6.3 EQUIPMENT LINES

Any Special pipe support instruction conveyed by equipment supplier shall be adhered.

7.0 FABRICATION, WELDING & TESTING

Welded supports shall be used in general.

Field welding to pipes for pipe supporting purposes shall be limited as far as possible. Field welding for pipe support purposes shall not be performed on the following pipe materials:

- Materials requiring Post Weld Heat Treatment.
- Lined carbon Steel Pipes (Glass, PTFE, Rubber, composite, etc).
- Non-ferrous Materials.

For pipes requiring Post Weld Heat Treatment, attachment required for supporting purposes shall be indicated on the piping isometric drawings, and welding shall be executed at the shop before Post Weld Heat Treatment.

All welds of support elements and supports to piping shall be continuous.

Welding, inspection, NDT testing of welded supports shall be in accordance to the following documents:

VSP-NIPI-TYP-GE-ST3-DW-01	Typical Standard Details – General Note
VSP-NIPI-TYP-GE-ST3-DW-02	Typical Standard Details – Welding Profiles
VSP-NIPI-TYP-GE-ST3-DW-03	Typical Standard Details – Beam Connections

8.0 SUPPORT COMPONENTS

Components to be used for supports fabrication shall be described in isometrics and pipe supports detail for shapes, bolts, forged pieces, plates, and miscellaneous material. These components shall be used for the design of supports.

For structural steel members, the most commonly used sizes and materials shall be adopted.

8.1 SUPPORT COMPONENTS TO STEEL BEAMS

Except noted on pipe support details, connection will be made by continuous fillet weld in field.

All secondary supports design, sizing and details will be specified in pipe support detail drawings.

8.2 SUPPORT COMPONENTS TO SENSITIVE EQUIPMENT

When required by the lead stress engineer piping connected to rotating equipment shall have adjustable supports to facilitate alignment, spading and equipment exchange.

To allow adequate clearance for the removal of covers, heads, channels, bundles and shells, lines shall not be supported on heat exchanges shells and heads.

The increase in width for the increasing pipe sizes is intended to provide additional adhesive area for the pad, which helps resist curling of the pad beneath the pipe.

The pad shall be attached to the support by using a silicone sealant or I-rod adhesive, which helps prevent the pad from curling beneath the pipe. Pads that have been drilled to allow the passage of the U-bolts and are secured with the U-bolts.

9.0 PAINTING AND MARKING

Painting of pipe supports shall be in accordance to Painting Specification for Platform VSP-NIPI-TYP-GEN-AC7-SP-01.

Except for small items which have restricted space for die-stamping (e.g. hanger rods, eye nuts, etc.) each standard support component shall in addition to paint making, be die-stamped with its size and identification mark. CONTRACTOR to field verify sizes of die stamp and pipe support paint marking of existing supports where sizes will be used to new pipe supports and will be tagged as shown in pipe supports details.

The non-die stamped items shall be legibly marked on a durable tag, securely attached to the component or support concerned.

Hot dipped galvanized items shall be die-stamped with their respective identification mark and serial number before galvanizing. After hot dipped galvanizing, these marks and numbers shall be marked by paint.

10.0 INSTALLATION

10.1 GENERAL REQUIREMENT

Before support installation, pipe surface preparation shall be carried out in accordance to Painting Specification for Platform VSP-NIPI-TYP-GEN-AC7-SP-01 and Specification for composite coating VSP-NIPI-TYP-GE-AC7-SP-03.

Piping shall be properly anchored and guided before pressure testing.

Pipe supports shall be able to sustain the hydrostatic test load of the piping they support, if applicable.

The length of pipe shoes shall be sufficient to prevent pipes moving off their supports when subjected to thermal expansion or contraction.

Adjustable supports shall be used where differential settlement between equipment and piping may occur.

Field-welded supports shall be set correctly in place and adjusted to the final position before welding to the pipe.

Base supports shall have welded end plates.

Dummy legs shall have a maximum length as specified in Pipe Support Standard VSP-NIPI-TYP-TS-PI1-GEN-01 and be provided with a 6 mm drain hole located at a short distance from the weld to the run pipe. Dummy legs shall not be installed at pipes operating below ambient temperature to prevent condensation to the run pipe.

For sliding supports, bearing surfaces shall be sufficiently clean to ensure unrestricted movement.

10.2 SPRING SUPPORT INSTALLATION

Tie rods shall be locked in their proper position before testing, and re-adjusted as necessary after testing in accordance with the installation instructions.

Spring assemblies shall be shipped to the job site with the springs compressed in the installed position as indicated on the pipe support detail drawing and/or requisition. They shall have caution tags attached which warns that the spring locks must be removed before the line is put in service.

Spring supports shall be installed with the spring locks in place. These spring locking plates or pins shall not be removed until hydrostatic testing and insulation of the piping system has been completed.

Note: In order to ensure the locking pins are available when next needed (e.g. during a shutdown) it should be considered to attach the pin with a plastic tie near the support.

Normally, all construction aids such as spring locks, temporary supports, welding tacks, etc. shall be removed prior to commissioning. However, if the spring force on the empty line will cause possible damage to connected strain sensitive equipment, the spring locks shall remain in position until the line is filled with the actual service fluid.

When using a blocking device, care shall be taken not to move the load indicator and/or the spring pressure plate. Springs shall not be de-blocked while the pipe is still empty.

Hanger rods for pipes subject to expansion or contraction of more than 75 mm shall be set equal to half of the calculated travel of the pipe at the point of support, in the opposite direction to the travel as indicated on the support detail drawing by Vendor, the piping arrangement drawing and/or the isometric drawing.

10.3 U-BOLT SUPPORT INSTALLATION

Composite coating shall be applied for uninsulated pipe in accordance to Specification for composite coating VSP-NIPI-TYP-GE-AC7-SP-03 before U-bolt installation.

U-bolt and I-rod shall be installed in accordance to instruction of manufacturer.

Clean the pipe support surface (structural frame) before applying I-rod adhesive to hold I-rod in place during installation.

The rounded I-rod surface must be in contact with the pipe to prevent corrosion.

Lock U-bolt using the two sets of nuts with washer, insulating washer, isolated bush provided in set. After tightening the first nut, thread a second one onto the same shaft and tighten it down to lock the nuts.

Add nut on top for non-gripping applications: slide U-bolt over pipe and thread a nut onto each shaft before placing through holes in I-rod. Adjust nut heights for desired clearance. Place nuts on bottom and tighten.

VIETSOVPETRO

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

VIETSOVPETRO
RESEARCH & ENGINEERING INSTITUTE

AGREED BY
Deputy General Director of
Vietsovpetro

Tran Xuan Hoang

06 / 03 /2020

APPROVED BY
Chief Engineer of Vietsovpetro

LIÊN DOANH VIỆT - NGA VIETSOVPETRO

Tran Van Vinh

06/03/2020

TYPICAL ENGINEERING DOCUMENTATION

DOCUMENT TITLE : SPECIFICATION FOR STRUCTURAL STEEL MATERIALS

DOCUMENT NO. : VSP-NIPI-TYP-GE-ST3-SP-03

AGREED:	Name	Date
Capital Construction Department	L.H.Giang 20/2/20	
Offshore Construction Division	P.T.Binh	

CONTROLLED

REV.	DES.	DATE	PREPARED	CHECKED	DEPART. MANAGER	ENG. MANAGER	PRO. MANAGER
0	IFA	12/02/2020	N.V.DIEP	N.V.THANG	D.D.THIEN	T.D.HAI	B.T.HAN

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1 INTRODUCTION

1.1 General

This specification defines the minimum requirements for manufacture of steel structure and other structure.

Structural steel consists of plates, rolled sections, seamless, mill welded circular hollow sections, beams and shall be suitable for fabrication of an offshore installation. Other materials include grating and stair treads.

This specification does not apply to steel supplied for the fabrication of pipelines, risers, process equipment, process piping, mechanical packages and other utilities.

The SUPPLIER shall be responsible for identifying any and all other requirements and/or criteria required, providing a design in line with good engineering practice and which meets the design objectives. Any such additional material design requirements and criteria so identified shall be advised to the VIETSOVPETRO in writing.

The SUPPLIER shall ensure that all material supplied meet requirements of this specification, codes and standards nominated herein, whether the material is supplied by the SUPPLIER directly or by a Vendor or subcontractor.

This specification shall not be interpreted as eliminating consideration of the manufacturer's standard shop practices which may receive approval if found to be equivalent, or superior, to the following specified requirements.

This specification is to be used in conjunction with the individual data sheets and/or drawings as referenced in the relevant project documents.

All deviations from this Specification or the documents referred to herein shall be stated in writing. In the absence of such a statement, it will be assumed that the requirements of the specification are followed without exception. Any deficiencies in this respect that are identified during or subsequent to fabrication shall be rectified at the SUPPLIER'S cost.

All documents related to the supplied materials (as VIETSOVPETRO'S requirements) shall be submitted to the VIETSOVPETRO before or at the time the materials reach VIETSOVPETRO'S end port.

1.2 Other of Precedence

The following order of priority shall apply to the various documents, codes and standards called up with the Invitation to Bid Package or Purchase Order:

1) VIETSOVPETRO Invitation to Bid/ Purchase Order.
2) VIETSOVPETRO Datasheets and Drawings.
3) This Specification.
4) International Codes and Standards.
5) Other related documents.
6) BIDDER'S Quotation.

In case of conflict on a given level of document then the VIETSOVPETRO shall decide which requirements shall take precedence, without cost or schedule impact.

The BIDDER shall clearly state and list exceptions to this specification, its attachments and all referenced Codes and Standards.

1.3 Definitions

Gr	Grade;
Max	Maximum;
Min	Minimum;
Shall	Refers to mandatory requirement;
Should	Refers to a recommendation.

1.4 Acronyms and Abbreviations

API	American Petroleum Institute
ASTM	American Society for Testing and Materials
AWS	American Welding Society
BS	British Standard
CE	Carbon Equivalent
EEMUA	Engineering Equipment & Materials Users Association
ICA	International Classification Authority
ITP	Inspection and Test Plan
MDR	Manufacturer's Data Report

NDT	Non Destructive Testing
OD	Outside Diameter
PO	Purchase Order
PSL	Production Specification Level
R&EI	Research and Engineering Institute of Vietsovpetro
VR	Vietnam Register
VSP	Vietsovpetro Joint Venture
UT	Untrasonic Testing
WPS	Weld Procedure Specification

1.5 Intend

The Supplier/Vendor shall comply with the requirements of this specification unless otherwise instructed by the Purchaser in writing.

1.6 Units

SI units shall be used.

1.7 Language

All documentations and communications shall be in the English language and Vietnamese.

1.8 Conflicting requirement

In the event of conflict, inconsistency or ambiguity between the Material Requisition, Data Sheets, this Specification, National Codes or Standards referenced in this Specification, or other documents, the Vendor shall refer to COMPANY, whose decision shall prevail. In principle, the requirements of the most stringent document shall apply.

Any errors or omissions in this Specification, noted by the Vendor, should be immediately brought to the attention of COMPANY.

2 REFERENCES TO CODES, STANDARDS

2.1 American codes and standards

The following Specifications and industry Standards and Codes shall be used for the design:

2.1.1 American Petroleum Institute

API RP 2A	Recommended Practice for Planning, Designing and Constructing Fixed Offshore Platforms - Working Stress Design.
API RP 2X	Recommended Practice for Ultrasonic Examination of Offshore Structural Fabrication and Guidelines for Qualification of Ultrasonic Technicians.
API RP 2Z	Recommended Practice for Preproduction Qualification for Steel Plates for Offshore Structures.
API SPEC 2B	Specification for the Fabrication of Structural Steel Pipe.
API SPEC 2H	Specification for Carbon Manganese Steel Plate for Offshore Platform Tubular Joints.
API SPEC 2W	Specification for Steel Plates for Offshore Structures, Produced by Thermo-Mechanical Control Processing (TMCP).
API SPEC 2Y	Specification for Steel Plates, Quenched and Tempered, for Offshore Structures.
API SPEC 5L	Specification for Line Pipe.

2.1.2 American Society for the Testing of Materials

A6/A6M	General Requirement for Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use.
A36/A36M	Standard Specification for Carbon Structural Steel.
A572	Standard Specification for High-Strength, Low Alloy Columbium-Vanadium Steel of Structural Quality.
A131	Standard Specification for Structural Steel for Ships.
A106	Seamless Carbon Steel Pipe for High Temperature Service.
A123	Zinc (hot Galvanized) Coatings on Iron and Steel Products.
A370	Standard Methods and Definitions for Mechanical Testing of Steel Products.

E23	Standard Methods for Notched Bar Impact Testing of Metallic Materials.
D610-95	Standard Methods for Evaluating Degree of Rusting on Painted Steel Surfaces.

2.1.3 American Welding Society

AWS D1.1	Structural Welding Code - Steel

2.1.4 British Standards

BS 7191	Structural Steel Materials for Use in the Fabrication of Fixed Offshore Steel Structures
BS EN 10204	Metallic Products – Types of Inspection Documents.

2.2 EEMUA

EEMUA 150	Structural Steel Materials for Use in the Fabrication of Fixed Offshore Steel Structures
EEMUA 158	Construction Specification for Fixed Offshore Structures Platforms

2.3 ISO

ISO 10474:1991

2.4 DNV

DNV -OS-B101	Offshore Standard: Metallic Material
DNV -OS-C101	Offshore Standard: Design of steel Structures General
DNV -OS-C201	Offshore Standard: Structure Design Offshore Units
DNV -OS-C201	Offshore Standard: Fabrication and Testing of Offshore Structure

2.5 Company standard

- Basic of Design for Structure each of the project
- VSP-NIPI-TYP-GE-ST3-SP-01 - Specification for Bolt Materials;
- VSP-NIPI-TYP-GE-ST3-SP-02 - Specification for Rubber Materials.
- VSP-NIPI-TYP-GE-ST3-SP-04 - Specification for Stainless Steel Materials.

3 REQUIREMENTS

3.1 General

All structural steel shall meet the requirements of API 2W, API 2H, API 5L, API 2B, ASTM A572, ASTM A131, ASTM A6/A6M and any additional requirements of the appropriate API or ASTM standard specified in Section 2 along with the relevant additional or specific test requirements as stated in this specification for each steel type.

Prior to the commencement of production, the Supplier shall provide a detailed summary of the process to be used for the production of all steel to this specification. As a minimum the following detailed information shall be submitted with the Tender:

a) Location and name of steel mill.

b) Recent production data to support that the values proposed for ladle and product analysis are achievable.

c) Steel manufacturing procedures.

d) Segregation procedures for continuously cast steel.

e) Control of sequential casting (for continuous casting).

f) Ingot or slab size including plate thickness ranges for each size.

g) Details of sulphur printing or alternative method of quality grading and frequency of checks for continuous casting.

h) Rolling procedures.

i) Dehydrogenation procedures.

j) Recent production data to demonstrate that Charpy V-notch impact values specified herein are achievable.

k) Information on the effect of extended times at stress relieving temperatures on tensile and Charpy V-notch impact properties.

l) Details of the quality control procedures to be implemented during production which should clearly identify all inspection points.

m) Details of proposed chemical analysis control.

n) Weldability information including mechanical testing results (macro hardness, Charpy V-notch, cross weld tensile).

o) For fabricated sections and welded tubulars all Weld Procedure Specifications (WPS) shall be submitted to the Purchaser for review and agreement prior to the commencement of the work. Requalification of welding procedures shall be required for fabrication of primary items unless otherwise agreed with the Purchaser.

3.2 Material grades

The project specific material grades are defined as follows:

Table 3.1: Material grades

Type	Material Grade	General Description	Typical Uses	Material Class (API)	Yield Strength (MPa)	Tensile Strength (MPa)
I	API 2H Grade 50 with S1, S3, S4, S5 and S8 Requirements API 2W Grade 50Z with S1, S3, S4, S5 and S8 Requirements	Primary High Strength	Jacket and Topside Joint Cans and Plates for Lift Point	II-A	345 Min 345 Min	483 Min 483 Min
II	API 2W Grade 50 with S1, S3, S5 and S8 Requirements API 5L Grade X52 with SR4, SR5, and SR17 Requirements	Primary High Strength	Jacket and Topside Rolled/seamless Tubulars; Plates	II-A	345 Min 360 Min	483 Min 455 Min
III	ASTM A572 Grade 50 or Equivalent ASTM A131 Grade AH36 or Equivalent	Primary High Strength	Plates, Hot Rolled Shapes	II-C II-B	345 Min 360 Min	450 Min 490 Min
IV	ASTM A36 or Equivalent	Secondary Mild Strength	Plates, Hot Rolled Shapes	I-C	250 Min	400 Min
V	API Spec 5L Grade B or Equivalent	Secondary Mild Strength	Seamless/Rolled Tubulars	I-C	245 Min	415 Min
VI	API 2W Grade 60Z with S1, S3, S4, S5 and S8 Requirements or Equivalent	Primary High Strength With Through Thickness Properties	Jacket Joint Cans and Plates for Lift Point	III-A	414 Min	517 Min
VII	API 2W Grade 60 with S1, S3, S5 and S8 Requirements or Equivalent	Primary High Strength	Jacket Rolled Tubulars; Plates	III-A	414 Min	517 Min

The Charpy V-notch impact test temperature and minimum average absorbed energy shall be in accordance with ASTM A673, Frequency H. Test section shall be taken transverse to the direction of rolling. The values for each material type are shown on tables from 3.2 to 3.6.

3.3 Steel Type I

Defined as "PRIMARY – through thickness properties" steel, the section types employing type I materials include Plates, Rolled Steel Pipe or Seamless Pipes.

Type I material shall conform to requirements one of the following table 3.2 below:

Table 3.2: General requirements of steel type I

Project Designation steel Type	Material Standard and Grade	Charpy V-Notch Testing		
		Temp (°C)	Min. Av. Absorbed Energy (Joules)	Minimum Single Value (Joules)
Type I	API 2H Grade 50Z API 2W Grade 50Z	-40	41	34

Detail requirements for type I steel:

- The type I steel shall meet the requirements for API Spec 2H Grade 50Z or API Spec 2W Grade 50Z (i.e., Supplementary Requirements S1, S3, S4, S5 and S8 are invoked).
- Basic oxygen furnace process with de-sulphurising and vacuum de-gassing, or electro slag remelting process, through-thickness steel plate shall be used in those areas so defined.
- Electric furnace process through-thickness steel may be used providing that nitrogen is reported on the ladle analysis and does not exceed 0.012% and that the soluble aluminum-to-nitrogen ratio is at least 2:1.
- The sulphur content shall be controlled per API Spec 2H/2W, S5.
- Through-thickness testing shall be performed as required by API Spec 2H/2W, S4.
- The material shall be ultrasonically tested by the mill in accordance with API Spec 2H/2W, S1.
- Strain-aging testing shall be performed for plate that will be strained in excess of 5% outer fiber strain in accordance with API Spec 2H and API Spec 2W, S8.
- Recommendation of purchaser: From the test described in the preceding item, the ultimate tensile value in the through-thickness direction shall be at least 90% of the minimum specified for the base steel.
- All other requirements not specifically modified above shall be in accordance with the applicable Specification.

3.4 Steel Type II

Defined as "PRIMARY" steel, the section types employing type II materials include plates, Rolled steel or seamless pipes. These pipes may be either seamless or produced via the SAW methods. The steel pipe shall conform to requirements of API 5L Grade X52 -- PSL 2.

Type II material shall conform to requirements one of the following table 3.3 below:

Table 3.3: General requirements of steel type II

Project Designation steel Type	Material Standard and Grade	Charpy V-Notch Testing		
		Temp (°C)	Min. Av. Absorbed Energy (Joules)	Minimum Single Value (Joules)
Type II	API 2W Grade 50 API 5L Grade X52	-40	41	34

3.5 Steel Type III

Defined as "PRIMARY", steel the section types employing type III materials include:

- Standard AISC Rolled Sections;
- Plates.

Type III material shall conform to requirements one of the following table 3.4 below:

Table 3.4: General requirements of steel type III

Project Designation steel Type	Material Standard and Grade	Charpy V-Notch Testing		
		Temp (°C)	Min. Av. Absorbed Energy (Joules)	Minimum Single Value (Joules)
Type III	ASTM A572 Grade 50 or Equivalent	-18	27	20
	ASTM A131 Grade AH36 or Equivalent	-29	27	20

3.6 Steel Type IV

Type IV material shall conform to requirements of ASTM A36 or equivalent.

Defined as "SECONDARY" steel the section types employing type IV materials include:

- Secondary steel sections (small section of beam, channel, and angle etc.);
- Plates (deck plate, secondary stiffener, secondary insert plate etc.);
- Grating steels, stair tread;
- Consumable steel.

3.7 Steel Type V

Type V material shall conform to requirements of API 5L Grade B (PSL1) or equivalent.

Defined as "SECONDARY" steel, the section types employing type V material include rolled steel or seamless pipes. These pipes may be either seamless or produced via the Electric Resistance Welding (ERW), Submerged Arc Welding (SAW) or "UO" methods.

- Secondary (walkway socket & handrail) steels;
- Secondary seamless pipes;

3.8 Steel Type VI

Defined as "PRIMARY – through thickness properties" steel, the section types employing type VI materials include plates, Rolled steel or Seamless Pipes. These pipes may be either seamless or produced via the SAW methods. The detail requirements for type VI steel apply detail requirements for type I in section 3.3 in this specification.

Type VI material shall conform to requirement one of the following table 3.5 below:

Table 3.5: General requirements of steel type VI

Project Designation steel Type	Material Standard and Grade	Charpy V-Notch Testing		
		Temp (°C)	Min. Av. Absorbed Energy (Joules)	Minimum Single Value (Joules)
Type VI	API 2W Grade 60Z	-40	48	41

3.9 Steel Type VII

Defined as "PRIMARY" steel, the section types employing type VII materials include Plates, Rolled Steel Pipe or Seamless Pipes. The steel pipe shall conform to requirements of API 5L Grade X60 – PSL 2.

Type VII material shall conform to requirement one of the following table 3.6 below.

Table 3.6: General requirements of steel type VII

Project Designation steel Type	Material Standard and Grade	Charpy V-Notch Testing		
		Temp (°C)	Min. Av. Absorbed Energy (Joules)	Minimum Single Value (Joules)
Type VII	API 2W Grade 60	-40	48	41

3.10 Chemical Composition

3.10.1 Chemical Composition for Steel Types I

The Steel Type I shall conform to the minimum chemical analysis requirements prescribed in Table 3.7.

An analysis of each ladle of steel shall be performed to determine the percentage of each element specified, or restricted by this Specification.

Table 3.7: Chemical Requirements for steel type I

Chemical Element	Requirement Wt. %	Chemical Element	Requirement Wt. %
Carbon, max.	0.16	Molybdenum, max.	0.08
Manganese	1.15 - 1.60	Copper, max.	0.35
Phosphorus, max.	0.03	Titanium	0.003 - 0.02
Sulphur, max.	0.010	Columbium, max.	0.03
Silicon	0.05 - 0.50	Nitrogen, max.	0.012
Nickel, max.	0.75	Aluminium	0.015 - 0.055
Chromium, max.	0.25		

The Carbon Equivalent of (CE and Pcm) the heat analysis shall be calculated by both of the following equations:

$$CE = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

$$Pcm = C + \frac{Si}{30} + \frac{Mn + Cu + Cr}{20} + \frac{Ni}{60} + \frac{Mo}{15} + \frac{V}{10} + 5B$$

The maximum carbon equivalent (CE and Pcm) calculated and reported shall not exceed as below:

Thickness Range	CE Maximum	Pcm Maximum
- Thickness up to 40 mm	0.39	0.22
- Thickness over 40 mm to 90 mm	0.41	0.23
- Thickness over 90mm to 150 mm	0.43	0.24

In case of the Columbium (Niobium), Vanadium Titanium and other rare earth metals use, the content of the applicable elements shall be reported on the test report; the sum of contents of above three elements shall not exceed 0.15% and content of other rate earth metals shall be agreed with purchaser.

3.10.2 Chemical Composition for Steel Type II

The steel type II shall conform to the minimum chemical analysis requirements prescribed in Table 3.8 or API Spec 5L PSL 2.

An analysis of each ladle of steel shall be performed to determine the percentage of each element specified, or restricted by this Specification.

Table 3.8: Chemical Requirements for steel type II

Chemical Element	Requirement Wt. %	Chemical Element	Requirement Wt. %
Carbon, max.	0.16	Molybdenum, max.	0.08
Manganese	1.15 - 1.60	Copper, max.	0.35
Phosphorus, max.	0.03	Titanium	0.003 - 0.02
Sulphur, max.	0.010	Columbium, max.	0.03
Silicon	0.05 - 0.50	Nitrogen, max.	0.012
Nickel, max.	0.75	Aluminium	0.015 - 0.055
Chromium, max.	0.25		

The Carbon Equivalent of (CE and Pcm) the heat analysis shall be calculated by both of the following equations:

$$CE = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

$$Pcm = C + \frac{Si}{30} + \frac{Mn + Cu + Cr}{20} + \frac{Ni}{60} + \frac{Mo}{15} + \frac{V}{10} + 5B$$

The maximum carbon equivalent (CE and Pcm) calculated and reported shall not exceed as below:

Thickness Range	CE Maximum	Pcm Maximum
- Thickness up to 40 mm	0.39	0.22
- Thickness over 40 mm to 90 mm	0.41	0.23
- Thickness over 90mm to 150 mm	0.43	0.24

In case of the Columbium (Niobium), Vanadium Titanium and other rare earth metals use, the content of the applicable elements shall be reported on the test report; the sum of contents of above three elements shall not exceed 0.15% and content of other rate earth metals shall be agreed with purchaser.

3.10.3 Chemical Composition for Steel Types III

The chemical composition for all grades and qualities of type III shall comply with the specified standards listed in table 3.1. In addition, the maximum carbon equivalent (CE and Pcm) shall be:

Thickness Range	CE Maximum	Pcm Maximum
- Thickness up to 40 mm	0.43	0.24
- Thickness over 40 mm	0.45	0.25

In which CE and Pcm as defined below:

$$CE = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

$$Pcm = C + \frac{Si}{30} + \frac{Mn + Cu + Cr}{20} + \frac{Ni}{60} + \frac{Mo}{15} + \frac{V}{10} + 5B$$

Alloy content shall be in accordance with type 3 in table 3 of ASTM A572/A572M-04 standard and the content of the applicable elements shall be reported on the test report. In case of the Titanium, Nitrogen and other rare earth metals use, the content of the applicable elements shall be reported on the test report too; the sum of contents of above two elements shall not exceed value of type 5 in table 3 of ASTM A572/A572M-04 standard and content of other rate earth metals shall be agreed with purchaser.

3.10.4 Chemical Composition for Steel Type IV and V

The chemical composition for all grades and qualities of steel type IV and V shall comply with the specified standards listed above. In addition, the maximum carbon equivalent (CE) shall be:

- Thickness up to 40mm, CEmax is 0.39;

In which CE as defined below.

$$CE = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

3.10.5 Chemical Composition for Steel Type VI

The steel type VI shall conform to the minimum chemical analysis requirements prescribed in Table 3.9 or API 2W grade 60Z.

An analysis of each ladle of steel shall be performed to determine the percentage of each element specified, or restricted by this Specification.

Table 3.9: Chemical Requirements for steel type VI

Chemical Element	Requirement Wt. %	Chemical Element	Requirement Wt. %
Carbon, max.	0.16	Molybdenum, max.	0.15
Manganese	1.15 - 1.60	Copper, max.	0.35
Phosphorus, max.	0.03	Titanium	0.003 - 0.02
Sulphur, max.	0.010	Columbium, max.	0.03
Silicon	0.05 - 0.5	Nitrogen, max.	0.012
Nickel, max.	1.0	Aluminium	0.015 - 0.055
Chromium, max.	0.25		

The Carbon Equivalent of (CE and Pcm) the heat analysis shall be calculated by both of the following equations:

$$CE = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

$$Pcm = C + \frac{Si}{30} + \frac{Mn + Cu + Cr}{20} + \frac{Ni}{60} + \frac{Mo}{15} + \frac{V}{10} + 5B$$

The maximum carbon equivalent (CE and Pcm) calculated and reported shall not exceed as below:

Thickness Range	CE Maximum	Pcm Maximum
- Thickness up to 40 mm	0.42	0.23
- Thickness over 40 mm to 90 mm	0.43	0.24
- Thickness over 90mm to 150 mm	0.45	0.25

In case of the Columbium (Niobium), Vanadium Titanium and other rare earth metals use, the content of the applicable elements shall be reported on the test report; the sum of contents of above three elements shall not exceed 0.15% and content of other rate earth metals shall be agreed with purchaser.

3.10.6 Chemical Composition for Steel Types VII

The Steel Type VII (API 2W Grade 60 or API 5L grade X60) shall conform to the minimum chemical analysis requirements prescribed in Table 3.10.

An analysis of each ladle of steel shall be performed to determine the percentage of each element specified, or restricted by this Specification.

Table 3.10: Chemical Requirements for steel type VII

Chemical Element	Requirement Wt. %	Chemical Element	Requirement Wt. %
Carbon, max.	0.16	Molybdenum, max.	0.15
Manganese	1.15 - 1.60	Copper, max.	0.35
Phosphorus, max.	0.03	Titanium	0.003 - 0.02
Sulphur, max.	0.010	Columbium, max.	0.03
Silicon	0.05 - 0.5	Nitrogen, max.	0.012
Nickel, max.	1.0	Aluminium	0.015 - 0.055
Chromium, max.	0.25		

The Carbon Equivalent of (CE and Pcm) the heat analysis shall be calculated by both of the following equations:

$$CE = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

$$Pcm = C + \frac{Si}{30} + \frac{Mn + Cu + Cr}{20} + \frac{Ni}{60} + \frac{Mo}{15} + \frac{V}{10} + 5B$$

The maximum carbon equivalent (CE and Pcm) calculated and reported shall not exceed:

Thickness Range	CE Maximum	Pcm Maximum
- Thickness up to 40 mm	0.42	0.23
- Thickness over 40 mm to 100 mm	0.45	0.25

In case of the Columbium (Niobium), Vanadium Titanium and other rare earth metals use, the content of the applicable elements shall be reported on the test report; the sum of contents of above three elements shall not exceed 0.15% and content of other rate earth metals shall be agreed with purchaser.

3.11 Mechanical Properties and Testing

3.11.1 Mechanical Properties and Testing Steel Types III, IV, V

The Mechanical Properties and Testing Conditions for all grades and qualities shall comply with the specified standards listed above.

For all mill-welded tubular, evidence of weld testing and HAZ impact properties should be provided.

3.11.2 Mechanical Properties and Testing Steel Type I, II, VI, VII

The Mechanical Properties and Testing Conditions for all grades and qualities shall comply with the specified standards listed above.

For all mill-welded tubular, evidence of weld testing and HAZ impact properties should be provided.

Test specimens:

Test specimens for all tests specified below shall be removed from the pipe after all finishing operations and shall not be subjected to thermal exposure that could alter the properties of the specimen. The pipe from which specimens are to be removed shall be selected at random.

Impact tests:

Character impact tests: all steel pipes Grade X52, Grade 50 Grade X60 or Grade 60 shall be performed on specimens removed from at least one pipe or one sheet in each batch of 50 but not less than one set of specimens from each individual heat of steel, or for any diameter or wall thickness variation within a single heat.

The impact tests shall be performed on the largest size impact test specimen obtainable for the diameter and wall thickness considered. The minimum average absorbed energy for full size specimens shall conform to the requirements given in Table 3.2 ÷ 3.6. The minimum individual value shall not be less than 70% of the specified minimum average value.

Non-destructive examination:

Plate and Skip Inspection: Plate and skip for production of Grade X52, Grade 50, Grade X60 and Grade 60 pipes by the submerged arc welding process shall be ultrasonically inspected prior to forming, for internal laminar imperfections to the requirements of ASTM A578/A578M level A or BS 5996:1993. Techniques 1 or 4 of BS 5996 shall be used for sizing. The identity of the UT technicians carrying out the tests shall be included in the NDT report. UT technicians shall have CSWIP UT qualifications or equivalent.

Seamless Pipe: Each seamless pipe shall be inspected full length for longitudinal and transverse defects by ultrasonic (or eddy current) methods. The calibration reference notch shall have a length not greater than 2 inches and a depth not more than 10% of the nominal specified wall thickness.

Weld Seams:

- For pipe fabrication according to API 5L: An ultrasonic inspection of the body of the weld seam shall be performed and both end areas of all seam shall be radio graphically inspected, all in accordance with the provisions of API 5L. HAZ impact properties shall also be provided.
- For pipe fabrication according to API 2B: An ultrasonic inspection of the weld seam shall be performed 100% in accordance with the provisions of API 2B with added 100% Magnetic test (MT).

Surface Rusting: Inspection of the degree of Rusting shall be in accordance with ASTM D610-95. Degree of rusting shall satisfy rust grade 7 (ref Table 1, D710-95).

3.12 Fabrication of the Pipes, Plate, Hot-rolled steel and Shapes

- Fabrication of the pipe with longitudinal seam shall be carried out in accordance with API SPEC 5L or API SPEC 2B.
- Fabrication of the rolled structural steel bars, plates, shapes shall be in accordance with A6 /A 6M.
- Fabrication of the seamless steel shall be in accordance with API SPEC 5L.
- Only one longitudinal seam weld is acceptable for the each rolled steel pipe.
- Not permit any splice on the each rolled steel pipe or seamless steel pipe.
- Not permit any splice on the each hot-rolled steel and shapes.
- Not permit any splice on the each steel plate.
- For longitudinal seam steel pipe accept pipe fabricated by rolling method or press method. However, when evaluating bidding documents the fabrication method will be considered in order of priority rolled/UO/JCO.
- In case of the pipe fabrication by press method, the ovality of pipe shall be careful control by factory, third party and purchaser.

3.13 Dimensions and Tolerances

- All dimensions and tolerances of the rolled steel pipes shall be in accordance with API SPEC 2B and API SPEC 5L.
- All dimensions and tolerances of the rolled structural steel bars, plates, and shapes shall be in accordance with A6 /A 6M.

- All dimensions and tolerances of the plates of Type I, Type II, Type III, Type IV, Type VI and Type VII shall be in accordance with API SPEC 2W.
- Unless otherwise specified, all pipes shall be beveled for welding in accordance with API SPEC 2B.

3.14 BIDDER Requirements

The BIDDER shall provide VIETSOVPETRO with at least 14 days notice to witness tests.

The BIDDER shall provide calibration certificates of testing instrumentation for review by the VIETSOVPETRO prior to each test location and environmental conditions.

Special requirements:

- All material shall be new, sound, free of defects, of the size and quality indicated, and shall be subject to approval by VIETSOVPETRO.
- Material with improper or inadequate certification documents (requiring additional test) are required to be re-certified by appropriate tests at BIDDER'S expense.
- BIDDER shall ensure that all tubulars, plates and shapes are properly marked at the point of manufacture and that markings be transferred to all parts cut from the tubular/plate.
- In the event that the materials furnished by BIDDER appear to exhibit properties not normally attributed to steel grade for inclusion in the structure and other indications which may contribute to poor weld ability, ductility, strength and toughness, VIETSOVPETRO will required additional testing to ensure that the steels used are acceptable for inclusion in the structure at no additional cost to VIETSOVPETRO. All additional testing shall be furnished by BIDDER.
- All steels shall be fully killed with fine grain size. Rimming steel and unskilled steels are not acceptable.
- Spiral element for any pipe works is not allowed.
- Beveled pipe ends shall be guarded from mechanical damages with standard mill's bevel protectors.
- Pipes shall be supplied with mill's standard Vanish coating on outside surfaces.

4 OTHER STRUCTURAL MATERIALS

Steel for grating and stair tread shall conform to ASTM A36.

All grating shall be of the welded type with parallel serrated bearing bars and "SPIRALED" cross bars. Bearing bar size and spacing shall be as specified in the structural drawings.

All grating and stair tread shall be hot-dipped galvanized after fabrication.

Grating shall be fastened securely to the structure by galvanized clips, or as indicated on the drawings. All bolts, nuts, clips and washers for fastening grating shall be hot-dipped galvanized.

The ends, of all bearing bars and all cut-outs shall have banding added prior to galvanizing.

Joints shall occur only at structural supports.

No equipment or pipe supports shall be supported on grating.

5 QUANTITY

According to VIETSOVPETRO Datasheets and Drawings:

Unit length of structural steel is specified in attached Material Specification.

6 MARKINGS

6.1 Plates and Rolled Sections

Die stamp:

The requirements for die stamping of plates and rolled sections are as follows:

- Heat or cast number;
- Type of steel and grade;
- Manufacturer's brand mark.

Note: The die stamped area shall be ringed with white paint, in order to clearly display its location.

Paint marking:

The requirements for paint marking of plates and rolled sections are as follows:

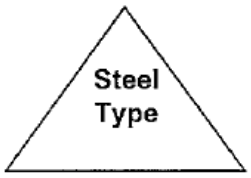
- Manufacturer;
- Purchase Order number and item number;
- Item size (thickness/width/length or section call-off - as appropriate);
- Material grade with S1, S3, S4, S5 and S8 supplement for type I, type II, type VI and type VII.
- Heat and plate number;
- Principal rolling direction.

Rolled sections shall be color coded using a 75mm wide paint stroke on the flanges /web at both ends of each piece. Flat plate shall be color coded using a 75mm wide paint stroke on both the upper and lower surfaces. The colours shall be as specified in Section 6.3.

6.2 Circular Hollow Sections

Each pipe delivered to this Specification shall be paint stenciled on the inside surface near one end with the following information:

- Purchase Order number and item number.
- Manufacturer, specification, size (outside diameter, wall thickness and length), grade, manufacturing process as per API 5L.
- Steel Heat Number.
- Character test details as per SR5B of API 5L.
- Identification No.
- Heat No, Batch, Cast No.
- Pipe Mill Reference Number and stamp.
- Third Party Inspector stamp.
- Material marking of all structural steel shall be white paint stenciled letters in black painted background giving details of Project, dimensions and theoretical weight. In addition all materials shall be color codes as follows:



Structural tubular shall be color coded using a paint stroke around the full circumference in a 75mm band at both ends of each piece. The colours shall be as specified in Section 6.3.

6.3 Colour Coding

Steel supplied to this Specification shall be color coded according to the following table:

Steel Type	Colour
I, VI	Yellow
II, VII	White
III	White
IV	White
V	White

7 QUALITY ASSURANCE

7.1 Quality Assurance

The BIDDER shall demonstrate that he operates a quality system in accordance with ISO 9000 or an equivalent international standard. The effectiveness of the quality system and the BIDDER'S compliance with it shall be subject to monitoring by the VIETSOVPETRO and in addition, may be audited following an agreed period of notice.

The BIDDER shall submit production process to suit each type of steel and ensure that the production process follow API/ASTM standard or equivalent standard for VIETSOVPETRO. All steel production process shall approval by independent third party (list of in section 7.3 in this document).

The BIDDER shall submit a quality control program for VIETSOVPETRO review at the time of tender. The BIDDER shall provide facilities for, and cooperate with, the VIETSOVPETRO and statutory authority inspectors during manufacturing, assembly and testing.

BIDDER shall submit his Quality Assurance Manual and Quality System Manual, containing all Quality related procedures to VIETSOVPETRO for review and approval.

BIDDER shall submit a tubular manufacturing Procedure to VIETSOVPETRO for approval.

BIDDER shall qualify Welding Procedures and Welders in accordance with VIETSOVPETRO specification.

No fabrication shall commence before VIETSOVPETRO approval of BIDDER Quality Plan, Inspection and Test Plan, Quality Procedures, Welding Procedures and Welders and Tubular Manufacturing Procedure.

7.2 Testing and Inspection

7.2.1 General

The BIDDER shall submit for review and approval by the VIETSOVPETRO an Inspection and Test Plan (ITP).

The VIETSOVPETRO shall be permitted to inspect the BIDDER'S facilities prior to placing an order. The successful BIDDER shall agree to the VIETSOVPETRO'S inspection throughout all phases of manufacturing.

Material testing to 3.1C level shall be witnessed by an independent body engaged by VIETSOVPETRO and approved by the VIETSOVPETRO.

VIETSOVPETRO shall have the right to inspect the manufacture of all materials, and shall have free access at all times to any part of BIDDER'S operation that concerns the work.

BIDDER shall furnish all necessary safety facilities, adequate lighting, measurement and test equipment etc. for safe and through inspection by VIETSOVPETRO.

An Inspection Certificate of each material item shall be submitted.

7.2.2 Visual Inspection/Workmanship

A visual examination of the inside and outside pipe surfaces, the weld bevels and the weld seam shall be carried out on each pipe. The standards of acceptance shall conform to API 5L with the following additional requirements.

Pipe bevels containing laminations shall be cut back until clear.

The SUPPLIER shall take all reasonable precautions to ensure that the pipe surface is free from imperfections that might interfere with the efficient application of an external coating. All loose scale shall be removed, and pitting and rough surfaces removed by grinding.

The maximum height of outside and inside weld bead shall be not more than 3.0 mm. All pipes shall be checked for weld bead height and shall be measured and recorded three times per shift.

Defects having a depth greater than 5% of the specified nominal wall thickness shall be considered unacceptable. Any defects having a depth less than 5% of the specified nominal wall thickness shall be considered as minor defects. Minor defects may be removed by grinding or polishing or both, provided that a smooth curved surface is maintained and that the wall thickness is not decreased below the specified minimum.

Any weld undercut exceeding 0.5mm deep shall be removed by grinding.

Defects consisting of sharp gouges shall be removed by grinding.

Thickness measurements shall be made on all areas where grinding has been carried out. The final thickness after grinding shall not be less than the specified minimum wall thickness.

Any cracks or leaks shall be clearly marked and the pipe length quarantined and made available for inspection or investigation by the INSPECTOR.

7.3 Mill Certificates

Mill certificates shall be provided to demonstrate that the primary steel (as defined by Steel Types I, II, III, VI and VII) has met or exceed all of the requirements specified in the Purchase Order. Mill certificates of primary steels are to be completed to BS EN 10204: 2004 Type 3.2 and ISO 10474 Type 3.2.

Mill certificates shall be provided to demonstrate that the secondary steel and major load bearing appurtenances has met or exceed all of the requirements specified in the

Purchase Order. Mill certificates of secondary steel materials are to be completed to BS EN 10204: 2004 Type 3.1 and ISO 10474 Type 3.1.

The independent third party inspection follows VIETSOVPETRO requirements are ABS (America), BV (France), DNV-GL (Norway) and LR (Britain).

In addition, the independent third party inspection certificates shall state:

- The identification of the material has been verified by the certification authority;
- That all tests were witnessed by the independent third party inspection agency;
- Agency or inspector's identification symbol;
- Name of manufacturer and factory symbol;
- Certificate number, date and revision;
- Heat numbers, charge no. or batch number;
- Complete chemical product and ladle analyses including trace elements;
- Specified chemical, mechanical and physical properties;
- Yield and tensile strength;
- Dimensions;
- Elongation measurements;
- Fracture toughness, if applicable;
- All supplementary requirements over and above the base reference standards as specified herein;
- When applicable, heat treatment procedure, furnace charge number of heat treatment records;
- Other identifying symbols;
- When applicable, NDT methods and results.

7.4 Official Monogram

The API Official Monogram 2H/2W Grade 50Z, Grade 60Z for mother plate to produce the pipe and plate of type I, type VI shall be provided to demonstrate that the manufacturer has license for use of it.

The API Official Monogram 2B/5L for manufacturer to produce the pipe shall be provided to demonstrate that the manufacturer has license for use of it.

The API Official Monogram for all steel types shall consider priority for bidder submit its.

However, the production process for all steel types shall follows section 7.1 in this document.

8 TRANSPORT, HANDLING AND STORAGE

Steel plate and rolled sections shall be loaded, transported and unloaded/stacked at the destination without being excessively stressed, deformed, or otherwise damaged. The VIETSOVPETRO will inspect and compile a damage report to record defects for immediate rectification in accordance with the Standard to the account of the SUPPLIER. Transport of mill produced pipe shall be in accordance with API RP 5LW and API RP 5LI.

All handling, loading and unloading shall be accomplished with slings or padded hooks in such a manner as to minimize mechanical damage.

Rail cars, trucks, lighters, ships or other conveyances shall be cleared of all debris prior to loading of pipes. Timber and dunnage shall be employed in sufficient quantity to prevent fatigue and mechanical damage during transit. Shoring and support of pipe for transit shall be subject to inspection and approval by the VIETSOVPETRO.

On-deck marine shipment is prohibited without written permission from the Principal following review of planned precautions to protect the material from damage and corrosion.

9 WARRANTY

The BIDDER shall have final and total responsibility for the manufacture and performance of all material supplied under this Specification.

Repair and replacement requirements:

- Material that does not meet the provision of this specification shall be rejected.
- All materials which are corroded due to improper storage, protection and/or maintenance shall be rejected.
- Repair by welding is not permitted in plates or seamless tubular. Repair to rolled sections and fabricated tubular shall only be permitted after approval by VIETSOVPETRO and according to BIDDER'S repair procedures which have been approved by VIETSOVPETRO.

VIETSOVPETRO

VIETSOVPETRO
RESEARCH & ENGINEERING INSTITUTE

DETAIL ENGINEERING SERVICE FOR BK.TNG WELLHEAD PLATFORM

PROJECT NAME : **DETAIL ENGINEERING SERVICE FOR BK.TNG WELLHEAD PLATFORM**

DOCUMENT TITLE : **PAINTING SPECIFICATION FOR PLATFORM BK-TNG**

DOCUMENT No. : **BK.TNG- 001-GEN-AZ- SP - 02**

CONTROLLED

1	IFRA	18/08/14	N.D. Bien	L.C.Thuy	Bushkovskiy	L.C.Thuy	P.H.Viet	L.V. Dzung
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A	IFR	28/05/14						
REV.	DES.	DATE	PREPARED	CHECKED	AGREED	DIS. LEADER	ENG. MANAGER	PRO. MANAGER

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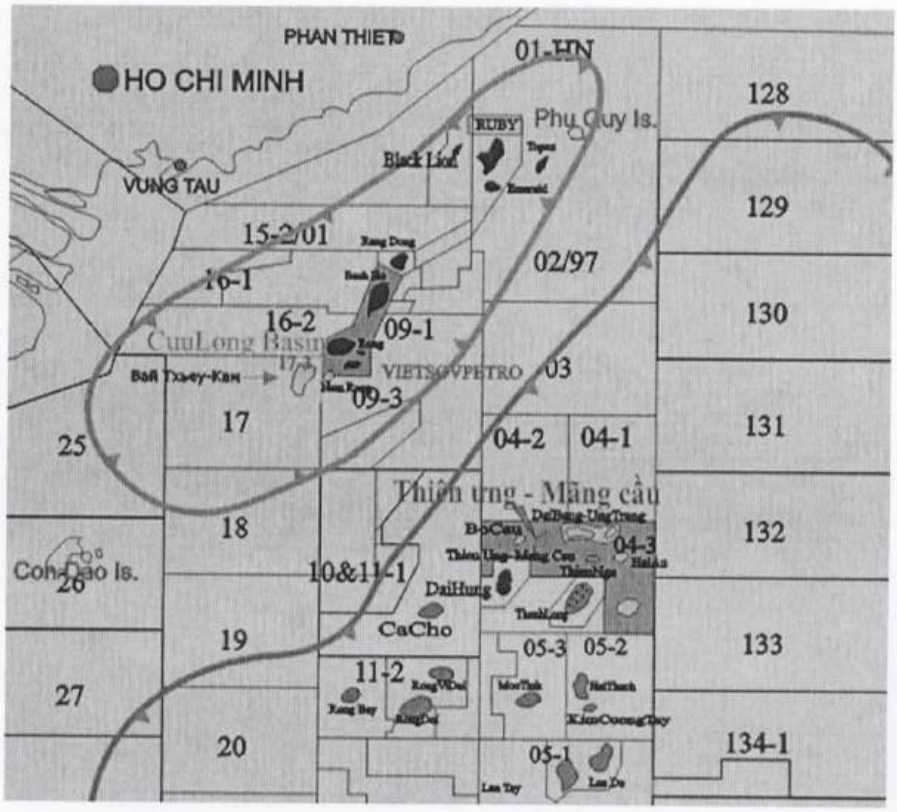
1. INTRODUCTION

1.1. Background

The Thien Ung field is located in the middle part of Block 04.3 in the Nam Con Son Basin, offshore the Socialist Republic of Vietnam, approximately 15 km of Dai Hung field and approximately 270 km southeast of Vung Tau. The block 04.3 covers an area of approximately 2600 km2. The Thien Ung field is including its 2 structural part. Thien Ung structure discovery was made in 2004 with the 04.3-TU-1X well. Two subsequent appraisal wells (04.3-TU-2X and 04.3-TU-3X), drilled and tested respectively, delineated the field.

Location of Thien Ung field is shown in Figure 1.1 below.

Figure 1.1: Thien Ung Reservoir Location



1.2. Purpose of document

Purpose of this document is to recommend general technical specification for protection painting design of steel structures, piping, and equipment of BK Thien Ung Platform.

1.3. Scope of work

This specification defines applicable painting specification and the minimum technical requirements for surface preparation, paint materials, protection coating application, repair and handling of steel structures, piping, and equipments of BK Thien Ung Platform.

1.4. Definition and Abbreviation

1.4.1. Definitions

PROJECT	Detail Engineering service for BK.TNG Wellhead Platform
COMPANY	Vietsovpetro (Referred to as VSP)
DESIGNER	The party which carries out all or part of the design, engineering, procurement, construction and commissioning of the project. Here the DESIGNER is a joined Team between Research and Engineering Institute (R&EI), a subsidiary of VSP, and an outside contractor.
MANUFACTURER/ VENDOR	The party on which the order or contract for supply of painting material.
CONTRACTOR	The party engaged to complete the fabrication portion of the Project works.

1.4.2. Abbreviation

VSP:	Joint Venture Vietsovpetro
R&EI	Research and Engineering Institute.
NCS2	Nam Con Son 2.
BK.TNG	Thien Ung Wellhead Platform.
ITB	Invitation to bid.
BS:	British Standard
NACE	National Association of Corrosion Engineers
ISO:	International Organization for Standardization
ASTM:	American Society of Testing and Materials

HSE:	Health, Safety and Environment.
RAL:	Standardized Paint Colour Codes.
VOC:	Volatile Organic Compound.
WFT:	Wet Film Thickness.
DFT:	Dry Film Thickness.
OSHA:	Occupational Safety and Health Administration.

1.5. Reference documents

1.	1014-BKTNG-MC-SP-0001	Painting and Coating Specification
2.	BK.TNG-001-GEN-AZ-SCH-01	Basic Painting schedules for Platform BK-TNG
3.	BK.TNG- 001-GEN-AZ- SP - 01	Abrasive Specification For Blasting Cleaning

2. CODES AND STANDARDS

The latest editions of all applicable codes, specifications and references shall define the minimum requirements applicable to the subject work and no statement contained in this specification shall construed as limiting the work to such minimum requirements.

Wherever conflicts or omissions between codes, specifications, and contract occur, the most onerous condition shall apply. Contractor is responsible for reviewing the list below and informing to the Client of any omission. All conflicts shall be formally brought to the attention of the Client.

The surface preparation, coating application, quality coat material and qualification of the applied coating shall comply with the requirements as set out in the following international standards and specifications of coat manufacturer(s).

ASTM D 4940	Standard test method for conductimetric analysis of water soluble ionic contamination of Blasting abrasives.
ASTM D 5762	Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates.
ASTM D 4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
ASTM D 4285	Standard Test Method for Indicating Oil or Water in Compressed Air
ISO 4628	Evaluation of paint and varnish defects. Designation of intensity, quantity and size of

	common types of defect - (Parts 1; 2; 3; 4; 5;6).
ISO 1514	Paints and varnishes. Standard panels for testing
ISO 8501	Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness - (Parts 1; 2; 3).
ISO 8502	Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness - (Parts 1; 2; 3; 4; 6; 9.
ISO 8503	Preparation of steel substrates before application of paints and related products. Surface profile of abrasive blast-cleaned steel - (Parts 1; 2; 3; 4).
ISO 21457: 2010	Material selection and corrosion control for oil and gas production systems.
ISO 8504	Preparation of steel substrates before application of paints and related products. Methods for surface preparation - (Parts 1; 2; 3).
ISO 12944	Paints and varnishes - Corrosion protection of steel structures by paint systems - (Parts 1; 2; 3; 4; 7; 8).
ISO 16276	Corrosion protection of steel structures by protective paint systems - Assessment of, and acceptance criteria for, the adhesion/cohesion (fracture strength) of a coating - (Parts 1; 2).
ISO 19840	Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces.
ISO 20340	Paints and varnishes - Performance requirements for protective paint systems for offshore and related structures.
NACE RP 0188	Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
SSPC SP-1	Solvent cleaning.
SSPC SP-2	Hand tool cleaning.
SSPC SP-3	Power tool cleaning.
SSPC SP-5	White metal blast cleaning.
ISO 9000	Quality management systems.

3. TECHNICAL REQUIREMENTS

3.1. Environmental conditions

Items that have had paint and protective coatings applied may be installed either outdoors in an unprotected area on an offshore platform or indoors. The paint and protective coatings shall be suitable for the environmental conditions specified for such installations in the Project Documents, and the specific details for the item being painted and coated

3.2. Painting and coating scope

3.2.1. Items to be painted

Offshore production facilities to be protected from corrosion with coatings covered by this specification include all equipments, piping, vessels, tanks, steel structures, platform jacket, etc.

3.2.2. Items not to be painted

The following surfaces and items shall not be coated

- Non metallic surfaces.
- Inside pipe.
- Rubber hoses, belts, flexible braided connectors
- Non-ferrous materials such as 90/10 and 70/30 Copper/Nickel alloys, Monel, Aluminum Bronze, and Nickel alloys when not thermally insulated
- Machined surfaces.
- Tags (nameplates).
- Conduit.
- Control panel.
- Motor shafts.

3.2.3. Items to be coated with passive fire protection

The safety department is responsible to identify position to be coated, areas, and requirements for passive fire protection materials.

3.2.4. Coating of Stainless Steels

Stainless steels shall be painted when requested in the present specification. Only piping, pipelines and vessels or other pressure containing equipments are concerned.

The following shall apply:

Stainless steel type	Coating requirement
Austenitic Stainless steel SS316/316L	Coated only if T > 60°C
Duplex Stainless steel 22%Cr DSS	Coated only if T > 100°C
Superduplex Stainless steel 25%Cr DSS	Coated only if T > 110°C
Stainless steel with thermal insulation	Coated

Zinc containing paints shall be prohibited on stainless steels.

All stainless steels shall be painted on areas in contact with carbon steel piping supports.

3.3. Proposal

The painting requirements will be defined in the relevant Project Specification. However it shall include as a minimum the following descriptive for each coating material:

- Coating manufacturer's name and address.
- Complete generic description.
- Trade name and ordering number.
- Percent zinc content by weight for primer coats and percent non-volatile solids content by volume for intermediate and finish coats.
- The proposal shall include the coating Manufacturer's standard product data sheets for each coating material.

3.4. Coating materials

Coating and other consumable materials shall be new. Materials shall be supplied unopened in the coating manufacturer's containers. The unopened containers shall be clearly identified. Labels and tags shall be intact and no coating shall be used after the manufacturer's recommended shelf life has expired.

Mixing of different coating materials is not permitted whether or not from the same coating manufacturer.

Coating material shall not be mixed or kept in suspension by using a bubbling air stream. If settling has occurred it must be remixed immediately before using. No thinner shall be added unless necessary for proper application. Type of thinner shall comply with the manufacturer's instructions.

Materials shall not be left in a spray pot longer than the coating manufacturer recommends. If this limit is reached, the pot shall be emptied and cleaned, the materials destroyed, and new material mixed.

The products of only a single coating manufacturer shall be used for each complete coating system discussed in this specification. The use of different coating manufacturer's products for successive coats on a single surface, or piece of equipment, is not permitted.

Thinning of coating materials is not allowed except when specifically called for in the coating manufacturer's recommendations. The procedure and limits for thinning shall be in accordance with the coating manufacturer's recommendations.

Successive coats shall be of a different color or tint to provide a contrast so that incomplete coverage can be detected.

Unless otherwise specified, the Contractor shall comply with the finish coat color schedule.

3.5. Application conditions

Coatings shall be applied under the environmental conditions established by the Coating Manufacturer. No coating shall be applied:

- On wet surfaces.
- When the relative humidity is above 85%.
- When the surface temperature is less than 3°C above the dew point.
- When the wind speed exceeds 7 m/s.
- When surface temperatures are more than 50°C or temperature recommended by the Coating manufacturer.

Outdoor surface preparation and coating shall be conducted during daylight hours. Indoor painting is allowed 24 hours a day in a well lit building if the environmental conditions as described are met inside the building at all times during preparation, painting, and curing.

The Contractor's work procedures, material handling and waste disposal methods shall include any additional precautions established by the COMPANY Representative to prevent release of pollutants to the surrounding environment.

Before painting application works commences, the Contractor shall verify that environment conditions are met application conditions on a daily report.

4. SURFACE PREPARATION

4.1. General

It is the intent of this Specification to minimize equipment or structure corrosion and to maximize the maintenance free service life. To this end each coating system shall be supplied and applied to provide protection for a service period of ten (10) years without significant re-work or maintenance.

The Contractor shall be responsible for the cost of surface preparation, removal of all unsatisfactory coating and application of the coating or system in accordance with the requirement of this Specification.

The Contractor shall provide skilled, experienced personnel to carry out all work and shall provide competent and qualified supervision and inspection services to ensure that the quality of painting works met with requirements of this Specification as well as complied with quality policy of COMPANY.

For equipment skids, surface preparation for coating application will be only carried out after all structural, mechanical, piping, and welding works have been completed on the equipment.

Before any cleaning operation commences, all rough edges shall be reduced, surface slivers and laps shall be ground out, and weld spatter and welds exhibiting excessive surface roughness shall be smoothed to ensure proper paint adhesion and uniform thickness.

Oil, grease, wax, dirt, and other foreign matter shall be removed by cleaning and degreasing of metal surfaces in compliance with SSPC-SP-1.

Surface preparation, including abrasive blasting, shall not be carried out in the areas where:

- Coating is being applied.
- The coating has not dried or cured.
- The coated surfaces may be contaminated with the residue of the surface treatment process.
- The preparation can affect on the open machinery.

Coated surfaces contaminated with abrasive or the residues of surface preparation operation shall be deemed unacceptable and shall be cleaned back to bare metal and re-treated to conform to the requirements of this Specification. All repair work shall be at the Contractor's expense.

Refreshing of previously coated materials shall be necessary only if the coating has been damaged.

Prior to the application of any protective coating, all damage to previously applied coatings shall be repaired. Damaged and loosely adhering coating(s) shall be removed, the area cleaned, edges of coating breaks feathered, and designated coat(s) reapplied.

The Contractor shall notify the COMPANY Representative immediately of any damaged galvanized surfaces. With COMPANY approval, the Contractor shall repair the damaged surfaces by:

- Solvent cleaning.
- Treating with a 10% by volume phosphoric acid wash or a vinyl butyral wash primer, or brush blasting.
- Applying a coat of the zinc rich primer suitable for galvanizing repair.

Immediately prior to any coating application, environmental conditions shall be checked to ensure the environmental conditions are within the limits established by the coating manufacturer and as stated in section 3.5.

Working parts of machinery, valves, instruments, glass faces of gauges, light fittings, control panels and consoles and surfaces that are not to be coated, etc shall be properly protected (shielded) against damage during abrasive blasting and form the ingress of blasting abrasives and residue, and from paint overspray.

Cloth, cloth tape, paper secured by tape, and/or grease protection is preferred for shielding. Shielding materials shall not be applied directly to the protected surface. After coating application finished, all such protection shall be removed and the underlying surface restored to the original condition.

4.2. Preparation of abrasive blasting

Prior to abrasive blasting al joints are to be continuously welded, and all corners, sharp edges of surface to be coated shall be rounded (minimum radius > 2 mm). Welds must be free of pinholes and all weld spatters is to be removed prior to blasting.

Abrasive blast cleaning shall be the preferred method of surface preparation for carbon steel and shall be completed, as a minimum, to comply with ISO 8501-1, SSPC-SP-10 or equivalent one at the time of coating.

The surface profile shall be assessed by a profile comparator or replica tape in accordance with ISO 8503. This assessment shall be carried out at random locations over prepared surface to provide an accurate assessment of the surface profile.

Openings in vessels, piping, and other appurtenances shall be properly protected against entry of abrasive material.

Before and after blasting, all welds shall be closely inspected for the presence of welding flux and spatter, slivers, inclusions, lamination, and underlying mill scale. Imperfections shall be mechanically removed and the immediate area re-blasted.

Prior to blasting, all oil, grease, mill varnish, soil, salt, and other contaminants shall be removed by solvent cleaning in accordance with SSPC-SP-1 "Surface Preparation Specification – Solvent".

4.3. Materials and conditions for abrasive blasting

Blast abrasive shall be dry, hard, clean and free from contaminates. It shall be of a type and size adequate to give a surface profile or anchor pattern of 50 microns to 85 microns unless specified otherwise. The abrasive shall contain not more than 75 parts per million chlorides by weight.

To achieve the required anchor profile, abrasive particle size shall follow the surface preparation commentary of the SSPC manual as necessary to comply with ISO 8501-1, SSPC-SP-10, surface Preparation Specification – White metal Blast Cleaning, or equivalent one.

Copper slag, silica sand, or other materials producing silica dust shall not be used.

Conductivity of abrasive shall be less than 250µS/cm as per ASTM D4940.

Abrasives shall be sealed in watertight packaging. Any delivered in defective packaging shall be rejected. Products must be stored sheltered from the elements.

The mixture of steel grit and steel short shall be used for blasting of carbon steel in the blasting chamber.

Blasting abrasives materials for use in blast cleaning structural steels with diameter more than 1200m and welding seams shall be in accordance with specified technical requirements in the Project's document "Abrasive specification for blasting cleaning".

Blasting is not permitted if the relative humidity is greater than 85%, or if the surface temperature is less than 3°C above the air dew point.

The compressed air used for blasting shall be free of detrimental amounts of oil and water. A test in accordance with ASTM D4285 shall be conducted to determine the presence of oil or water in compressed air used.

Adequate separators and traps shall be provide, installed in the coolest part of the system. They shall be emptied regularly to prevent carry over of water and oil. Accumulation of oil and moisture shall be removed from the air receiver by regular purging.

Blasting to white metal shall be allowed only during daylight hours. The first primer coat shall be applied to the blasted surface before sundown of the same day. Surfaces that remain uncoated overnight shall be re-blasted to white metal prior to applying the first primer coat.

Where repair or re-coating is carried out on coating systems, the affected area shall be whip blasted to provide adequate paint key. The blast cleaning shall carry over to the secure surrounding coating for a distance not less than 25 mm. The coating edges shall be chamfered by a method approved by the COMPANY.

4.4. Blast cleaning of carbon steel

All steel surfaces to be coated shall be blast-cleaned to near white metal in accordance with standard ISO 8501 or equivalent.

Surfaces are to be applied shall have anchor patterns in range of 50-85 microns and 70-120 microns. In general, blasted surface shall have anchor patterns in accordance with the coating manufacturer's recommendation.

After blast-cleaning, all dust must be removed using a vacuum cleaner before application of the paint. A test in accordance with ISO 8502-3 shall be conducted to determine quantity of dust.

All blast-cleaned surfaces shall be coated before the deterioration of the "grade of cleanliness". In any case, any surface that has been blast-cleaned shall be coated on the same day.

Surface blasting to near white metal shall extend a minimum of 150mm beyond the area to be coated during the same day. Surface blasting to near white metal shall continue a minimum of 25mm into adjoining previously coated surfaces.

No acid washes, cleaning solutions, solvents, or inhibited washes intended to prevent rusting shall be applied to surfaces after abrasive blasting and prior to the first primer coat application.

The blast cleaning procedure shall be submitted to COMPANY for approval.

4.5. Blast Cleaning Of Stainless Steels

Stainless steel surfaces to be coated shall be etched or degreased and sweet blast with dry non-ferrous and chlorine-free abrasive.

The blast cleaning procedure to be submitted to COMPANY shall include:

- Abrasive composition to obtain a surface roughness 25 -50 microns for stainless steel.
- Dust level (level 2 Maximum according to ISO 8502-3)
- Substrate contamination checks. Ferrous contamination / direct colorimetric method using Prussian blue (potassium ferricyanide) - No surface pollution is acceptable.

To reduce the risk of unacceptable damages on the substrates while sweet blasting stainless steel surface , it is recommended that a reduced nozzle pressure be used in combination with a small size abrasive.

4.6. Surface Preparation by Mechanical Power Tools

In the event of abrasive cleaning being impossible or unsuitable, steel surfaces may be mechanically cleaned using power tools such as wire brushes, needle guns, etc., power tool cleaning shall be performed according to grade St.3 of the standard ISO 8501-1 or equivalent.

The surfaces shall be solvent cleaned as per specified in standard SSPC SP-1 before cleaning with mechanical power tools.

5. PAINT APPLICATION

5.1. General coating application

Coating shall be applied in accordance with the requirements established by this specification and the recommendations of the coating manufacturer. Any area not specifically covered shall be in accordance with the principles and guidelines set forth in the SSPC Manual.

There should be no deep or detrimental brush marks. Paint shall be worked into all crevices and corners. Runs or sags shall be brushed out.

No coating shall be applied to surfaces that have not been prepared in accordance with requirements of section 4.

Prior to coating, surfaces blasted to white metal shall be dust free. The dust remaining on the surfaces shall be removed by dry brushing or by vacuuming with an industrial vacuum cleaner. Pressure air blowing is permitted if suitable precautions are taken to ensure that the air is free of moisture, oil, and other contaminants.

Coatings shall not be applied within 150 mm of unprepared surfaces or within 150 mm of edges prepared for subsequent welding.

The initial primer coat shall be applied as soon as possible after preparation. In all cases the primer coat shall be applied during daylight hours on the same day that the surface is prepared.

In general, intermediate and finish coatings shall be applied following final assembly of component parts. Surfaces shall be in the final configuration.

Any surfaces inaccessible for proper coating application and/or inspection shall be coated prior to final assembly. Specifically, flange faces and bolt holes shall be coated prior to final installation. The COMPANY representative will designate inaccessible areas.

Prior to applying a succeeding coat, all coatings shall be allowed to dry at site ambient conditions for at least the minimum time specified by the coating manufacturer and not longer than the maximum time for site ambient conditions.

No coating shall be applied over a previous coating that is not thoroughly dry.

Coatings shall be applied by brush to all crevices, corners, edges, and other hard-to-spray areas.

The coating film thickness referred to in this specification shall be the dry film thickness measured by a properly calibrated film thickness gauge and are minimum values.

All areas such as external corners and edges, welds, bolts, nuts and interstices (excluding galvanized surfaces) shall receive a "stripe" coat prior to application of the specified coat (excluding the inorganic zinc silicate primer) to ensure that these areas have at least the minimum specified film thickness and to ensure

continuity of the coating. The "stripe" coat shall be allowed to become touch-dry prior to coating with the specified coat.

All areas that will be subject to welding after painting shall be masked after blast cleaning. Masking shall preferably be with cloth or cloth tape and shall extend at least 50 mm on all sides of the intended weld area.

Nameplates shall be suitably masked before blast cleaning to protect from blasting abrasive and paint.

The cured coatings shall be visually free of pinholes, voids, bubbles, mud cracking and other "holidays".

Each coat shall be in a proper state of cure or dryness before the application of the next coat. Material shall be dry for re-coating when an additional coat can be applied without the development of any detrimental film irregularities, such as lifting or loss of adhesion of the undercoat. Manufacturer's instructions shall be followed.

When successive coats of the same color have been specified, alternate coats shall be tinted, when practical, sufficiently to produce enough contrast to indicate complete coverage of the surface. When the material is the color of the steel, or when the tinting of the final coat is objectionable, the first coat to be applied shall be tinted. The tinting material shall be compatible with the material and not detrimental to its service life.

Prior to the application of any coat of material all damage to previous coats shall be touched up with the specified coating. Damage prior to delivery of finish coating shall be re-primed and refinished.

5.2. Spray application

Spray coating shall comply with the following:

- Coating Manufacturer's recommendations.
- Spray equipment Manufacturer's recommendations for the coating material.
- This specification.

Spray equipment

Conventional air spray equipment shall be suitable for the intended purposes. The type of gun, air caps, nozzles, and needles shall comply with the coating manufacturer's application instructions and data sheets.

Suitable traps and separators shall be installed to remove water, oil, and other contaminants from the air supply. Traps and separators shall be of the continuous-bleed type and shall be checked frequently to prevent carry over.

Suitable regulators and gauges shall be installed in the air supply to the pressure pot and the gun.

Airless spray equipment is acceptable if the minimum requirements established in this specification are met, if airless spray application is recommended by the coating manufacturer, and if specific equipment is approved by the Company.

Application

Prior to application, all coating materials shall be vigorously stirred and/or agitated in spray pots until pigments, vehicles, and catalysis are thoroughly mixed. During application, coatings can be continuously stirred by mechanical spray pot agitators or other approved means if required by the Manufacturers.

Prior to adding new material, lines, pots, and guns shall be thoroughly cleaned following each application. Solvents left in the equipment shall be completely removed before coating the prepared surfaces.

For optimum spraying effectiveness, the pressure on the material in the pot and of the air at the gun shall be adjusted and maintained to deliver the material at the rate specified by the coating manufacturer. Air pressure and volume shall be the minimum required to properly atomize the coating material.

The spray pattern shall be adjusted so that the coating is deposited in uniform layers with the correct wet film thickness.

The spray gun shall be held perpendicular to the surface at all times and at a distance that will ensure depositing a fully wet layer of material on the surface. Arching of the spray gun is not permitted.

Parallel, even passes shall be made that overlap the previous spray coating by 50 percent. Large continuous surfaces shall be coated by two passes made at right angles to each other.

All runs, air bubbles, sags, and other imperfections shall be brushed out immediately or the coating shall be removed and the surface re-sprayed.

5.3. Brush application

Coatings shall be applied with a brush in all areas that cannot be spray coated properly.

Brushes shall be of a style, quality, and composition (pure bristle or nylon bristle) that enable proper coating application.

Round or oval brushes are the most suitable for rivets, bolts, irregular surfaces, and rough or pitted steel.

Wide flat brushes are suitable for large flat surfaces. A brush width greater than 125 mm is not acceptable.

Successive coats shall be applied by crosshatching the previous coat.

Runs, air bubbles, and sags shall be brushed out immediately.

Coating shall be worked into all crevices and corners. Surfaces not accessible to brushes shall be coated with daubers.

5.4. Touch-up and Repairs

Touch-up and/or repair of damaged coating shall be carried out to ensure that the coating requirements for the particular surface comply with this Specification.

Coating damage not exposing steel surfaces shall be cleaned and abraded. Hard edges shall be feathered. The coating shall be made good to the full coating system nominated for the area and complying with this specification.

Coating damage exposing steel surfaces shall be re cleaned and coated with the suitable method in accordance with the requirements of this specification.

5.5. Drying of Coated Surfaces

No coat shall be applied until the preceding coat has dried. The material shall be considered dry for re-coating when another coat can be applied without the development of any film irregularities such as lifting or loss of adhesion or undercoats, and the drying time of the applied coat does not exceed the maximum specified for it as a first coat.

No paint shall be force dried under conditions that will cause cracking, wrinkling, blistering, formation of pores, or detrimentally affect the condition of the paint. No drier shall be added to a point on the job unless specifically called for in the manufacturer's specification for the paint.

Paint shall be protected from rain, condensation, and contamination until dry to the fullest extent practicable.

6. WORKMANSHIP

The Contractor shall comply with the minimum requirements established by this specification, but has exclusive control over the detailed manner for performing the required work. The Contractor shall work in a careful, diligent, and prudent manner and shall achieve results that exhibit high quality craftsmanship.

The Contractor only used trained persons for blasting, painting application, supervise, and inspection. Certificates of personnel shall be submitted to COMPANY for approval before any painting application work commences.

Prior to beginning work, all Contractor personnel shall be thoroughly familiar with the material, equipment, this specification, and all applicable standards and codes.

Care shall be exercised at all times to prevent splashing, dropping, spillage, and over spray of coating and abrasive materials.

The Contractor shall protect all equipment, walls, floors, ceilings, and other surfaces from damage by coating materials and other contaminants.

The Contractor shall clean any accidentally applied material from all surfaces. No permanent color or stain shall remain from accidentally applied materials.

Good housekeeping procedures shall be established and followed at all times. When work is complete, the Contractor shall leave all work areas in a condition equal to that when work began.

7. INSPECTION / TESTING AND ACCEPTANCE CRITERIA

The Contractor shall perform inspection and testing activities complying with requirements of this Specification and/or recommendation's paint manufacturer.

A inspection and test plan shall be prepared by the Contractor and shall be submitted to COMPANY for approval.

As a requirement for each painting system the following aspects of the work shall be documented and recorded in painting inspection report, but not limit:

- Quality of surface preparation (surface profile, cleanliness, etc.)
- Dry film thickness of each coat.

- Dry film thickness of the total system.
- Coating supplier.
- Coating batch number.
- Ambient conditions, including: ambient temperature, surface temperature, dew point and relative humidity.
- Visual aspect of the coating.

The coating inspection reports should be signed by the COMPANY's nominated representative.

7.1. Inspection equipment used for inspection

The Contractor is responsible for quality of equipment to be used during qualification test. All equipments shall be calibrated by the authorized organization.

Certificate of calibration of equipments and list of equipment shall be submitted to COMPANY for approval before test panel/ inspection activities commence.

7.2. Ambient atmospheric and surface temperature conditions

Prior to commencement of any coating operation, the surface temperature, ambient temperature, dew point and relative humidity shall be measured and recorded to the daily report.

7.3. Surface preparation quality

The cleanliness of the cleaned surface shall be Sa 2 ½ according to the standard ISO 8501-1 or equivalent.

Anchor profile shall be compliance the requirement ranges of each coating system.

7.4. Assessment of dust on the cleaned surface

The cleaned surface shall be inspection for dust rate in accordance with standard ISO 8502-3. Dust quantity rating 2 for dust size class 2 is acceptable.

7.5. Contamination chlorides test

Chloride content shall be tested in accordance with standard ISO 8502-6 and 8502-9, with maximum acceptance of 30mg/m2.

7.6. Wet film thickness measurement

Wet film thickness shall be measured and recorded for each coat application by the wet film combs such as Elcometer 112 or equivalent.

7.7. Dry film thickness measurement

Each individual coat and coat system shall be measured for DFT. Method for measuring DFT shall be in accordance with ISO 19840 using appreciate thickness gauge such as Elcometer 456 or equivalent.

7.8. Adhesion strength test

Pull-off test is used for evaluation the adhesion of coating system to the metal substrates. Pull-off test shall be carried out in accordance with ASTM D 4541 using hydraulic adhesion tester PAT or equivalent for coating system total DFT above 200 microns. Adhesion strength shall be compliance the requirement of each coat system. The coat system to be tested shall be fully cured, clean, dry and free of oil, dirt and other contaminates.

7.9. Holiday test

Holiday test shall be performed on the final coat of the system in accordance with NACE RP 0188. The coat system to be tested shall be fully cured, clean, dry and free of oil, dirt and other contaminates.

7.10. Acceptance Criteria

Table 10.1 Inspection plan and acceptance criteria

Test type	Testing method	Acceptance criteria	Frequency
Surface preparation			
Environment conditions	N/A	- 3°C above dew point. - Relative humidity: max 85%.	Before start of each shift
Visual examination	Visual for sharp edges, weld splatter slivers, rust grade	No defects	100% surface
Cleanliness	ISO 8501-1	Grade Sa $2^{1/2}$ /St3	100% surface
Dust test	ISO 8502-3	Rate 2 for dust size class 2	
Chloride	ISO 8502-5	Max. 30mg/m^2	Random
Conductivity	ISO 8502-9	Max. 70 µS/cm	Random
Paint application and final inspection/testing.			
Environment conditions	N/A	- 3°C above dew point. - Relative humidity: max 85% . - Ambient temperature max. 50°C or temperature recommended by the Coating manufacturer	Before start of each shift
Visual examination of coating	Visual to determine curing, contamination, pin holes sagging , appearance, color, etc.	No defect	100% surface

Test type	Testing method	Acceptance criteria	Frequency
Holiday detection	NACE RP 0188	No holiday	As per coating system specification
Adhesion	ASTM D 4541	As per requirement of each coating system	On test panel
Dry film thickness	ISO 19840	ISO 19840	5 reading per $10m^2$.

8. TEST PLAN

When required for qualification new paint materials, the coats shall be reviewed and qualified in accordance with test plan of paint materials offered in section 7.

9. HEALTHS AND SAFETY

All Coating Contractors using this standard shall have a section in their Safety Management System devoted to industrial coating applications. This shall include, but not be limited to the following sections:

9.1. General

A safe area shall be established and clearly identified for handling and storage of all flammable materials and for waste disposal. No source of ignition shall be permitted within the safe area at any time.

The Contractor shall take proper precautions before and during work in confined areas and/or in areas with the potential for fire or explosion.

If possible, all electrical equipment shall be located remote from the hazardous work area in a well-ventilated, non-hazardous space.

All electrical equipment intended for such areas shall be of an approved type in accordance with the area classification requirements established by the relevant IEC codes.

The Contractor shall provide and maintain fire extinguishers approved for the expected fire hazard near or in all work areas.

The Contractor shall provide and install sufficient scaffolding and staging for easy access during surface preparation, coating application, and inspection of all surfaces.

The supporting structure and the surface or item being worked on shall be constructed so that workers will have free use of body and arms.

The structures shall be provided with safety features that will help prevent accidents. The structures shall comply with all applicable OSHA requirements.

The Contractor shall exercise extreme care and caution when working in the vicinity of in-service facilities. All valves, switches, and controls shall remain unmoved and undisturbed.

9.2. Handling of Chemicals

Material Safety Data Sheets (MSDS's) shall always be available for review during transport and prior to the application of the product. Manufacturers instructions for the safe handling of products shall be followed to minimize the risk of injury or creation of health hazards to personnel.

Handling of coatings and chemicals shall be carried out with due care and diligence.

The correct use of personal protection equipment (PPE) shall be employed during the coating preparation and application.

Disposal of chemicals must be treated with due regard to environmental protection.

9.3. Spray and blasting operations

Abrasive blasting and spray coating shall be performed with approved equipment by experienced operators.

The Contractor shall provide all operators with hoods for protection against abrasives and with paint masks that are OSHA approved for extended service. The hoods and masks shall be worn at all times when work is being done.

Pressure vessels, such as sand hoppers and compressed-air volume tanks, shall be protected from over-pressurization with automatic pressure relieving devices.

Pressure nozzle controls shall be of the fail-safe, dead-man type.

Pressure hose connections shall incorporate a positive locking mechanism to prevent accidental disconnection (For example, quick-connect connections shall have safety wire in place).

Adequate ventilation shall be provided in confined areas with blowers capable of a minimum of 12 air changes per hour.

Spray and blasting equipment in confined areas shall be securely grounded to dissipate static electrical charges.

Hand tool shall be made of spark-proof materials.

9.4. Pressure Equipment

The safe operation of all pressure equipment shall be detailed in the Contractor's Safety Management System and show how, when and records for the inspection of such equipment. The equipment and associated connections shall be regularly inspected and well maintained.

9.5. Earthing connection

All equipment, particularly nozzles, tanks, piping and cable trays and cable ladders shall be earthed to prevent sparking and electric shocks from static electricity.

9.6. Breathing Apparatus

Appropriate air-fed masks should be used during blasting and coating operations. Other personnel in the vicinity shall wear suitable protective masks or respirators when necessary. Adequate ventilation must be provided in confined spaces and when using air-fed masks in these areas, attention should be paid to the

possibility of explosive vapor build-up. As a minimum, dust, rust and vapors should be directed away from the operator by wind or extraction fan.

10. HANDLING AND SHIPPING OF FINISHED PRODUCT

Once all coatings have been applied and fully cured the equipment shall be packed by the Contractor ready for shipment. Packaging shall allow for the shipment method and route to ensure that no mechanical or other damage to the coating will occur in transit. The Contractor shall be responsible for any coating repairs, which are found necessary upon receipt and un-packaging of the goods.

11. COATING SYSTEMS

Coating systems offered in appendix 1 are recommended for new building of BK-TNG.

For each system, CONTRACTOR/ COATING CONTRACTOR shall submit a detailed specification for COMPANY approval. The coating system shall qualified/tested which demonstrate the performance of the complete coating system at the specified dry film thickness in accordance to ISO 20340 in a C5-M (atmospheric corrosivity category) with high (H) durability according to ISO 12944.

For the BK-TNG modification to receive gas from Dai hung field including modification of BK-TNG platform and touch-up after installation of equipments, piping systems, etc., the coating systems mentioned in the appendix 1 should be modified on DFT, number of layers, etc. in accordance with marine environment and practical construction conditions in offshore platform.

12. APPENDIX 1: COATING SYSTEMS

1. **Coating system №-1 for steel structures above cellar deck, including: stairs, hatch covers, kick plates, piping systems, equipments, SKIDs, framing decks, rows, trusses, walls without thermal insulation and others.**

   Initial painting and Spot repair painting.

№ of coat	Generic name paint system	DFT ((μm)	Pull off test value (Hydraulic equipment)	Guarantee requirement	Remarks
1	2	3	4	5	6
	Surface preparation to cleanliness Sa 2.5 ISO 8501-1. Surface profile: Rz = 50÷85 μm.				
1st	Rich Zinc epoxy	60	Min.5MPa	5 years	
2nd	Modified Epoxy	100			
3rd	Modified Epoxy	100			
4th	Polyurethane	50			
	Total dry film thickness:	**310**			

2. **Coating system №-2 for upside of decks: main deck, mezzanine deck, upper deck, helideck, and steel structures in the atmospheric zone (including jacket, stairs, sump deck and cellar deck, etc.).**

   Initial painting and Spot repair painting.

№ of coat	Generic name paint system	DFT ((μm)	Pull off test value (Hydraulic equipment)	Guarantee requirement	Remarks
1	2	3	4	5	6
	Surface preparation to cleanliness Sa 2.5 ISO 8501-1. Surface profile: Rz = 70÷120 μm.				
1st	Glass flake Epoxy	500	Min.7MPa	5 years	
2nd	Glass flake Epoxy	500			
	Total dry film thickness:	**1000**			

Note: Number of paint layers applied for Helideck can be changed if using antiskid coating option.

3. **Coating system №-3 for splash zone of jacket from EL(-)4.0m to 6.2m including jacket, boat landing, caissons, etc.**

Initial painting and Spot repair painting.

№ of coat	Generic name paint system	DFT ((μm)	Pull off test value (Hydraulic equipment)	Guarantee requirement	Remarks
1	2	3	4	5	6
	Surface preparation to cleanliness Sa 2.5 ISO 8501-1. Surface profile: Rz = 70÷120 μm.				
1st	Glass flake Epoxy	500	Min.7MPa	5 years	
2nd	Glass flake Epoxy	500			
3rd	Glass flake Epoxy	500			
	Total dry film thickness:	**1500**			

4. **Coating system №-4 for galvanized surfaces, brass piping CuNi of fire-fighting systems above cellar deck.**

Initial painting and Spot repair painting.

№ of coat	Generic name paint system	DFT ((μm)	Pull off test value (Hydraulic equipment)	Guarantee requirement	Remarks
1	2	3	4	5	6
	Degrease surfaces in accordance with the standard SSPC-SP1.				
1st	Epoxy Primer	60	Min.2MPa	3 years	
2nd	Polyurethane	50			
	Total dry film thickness:	**110**			

5. Coating system №-5 for galvanized surfaces, brass piping CuNi of fire-fighting systems below cellar deck.

Initial painting and Spot repair painting.

№ of coat	Generic name paint system	DFT ((μm)	Pull off test value (Hydraulic equipment)	Guarantee requirement	Remarks
1	2	3	4	5	6
	Degrease surfaces in accordance with the standard SSPC-SP1.				
1st	Epoxy Primer	60	Min.2MPa	3 years	
2nd	Modified Epoxy	150			
3rd	Polyurethane	50			
	Total dry film thickness:	**260**			

6. Coating system №-6 for insulated carbon steel and stainless steel surfaces to high temperature <120°C

Initial painting and Spot repair painting.

№ of coat	Generic name paint system	DFT ((μm)	Pull off test value (Hydraulic equipment)	Guarantee requirement	Remarks
1	2	3	4	5	6
	– Carbon steel: Surface preparation to cleanliness Sa 2.5 ISO 8501-1. Surface profile: Rz = 50÷85 μm. – Stainless steel: Sweet blast with dry, non iron containing abrasive materials,. Surface profile: Rz = 25÷50 μm.				
1st	Phenolic epoxy	100	Min 3MPa	1 years	
2nd	Phenolic Epoxy	100			
	Total dry film thickness:	**200**			

7. Coating system №-7 for non-insulated stainless steel operating in temperature below 120°C

Initial painting and Spot repair painting.

№ of coat	Generic name paint system	DFT ((μm)	Pull off test value (Hydraulic equipment)	Guarantee requirement	Remarks
1	2	3	4	5	6
	Sweet blast with dry, non iron containing abrasive materials,. Surface profile: Rz = 25÷50 μm.				
1st	Epoxy primer	60	Min 4MPa	5	
2nd	Modified epoxy	100			
3rd	Polyurethane	50			
	Total dry film thickness:	**210**			

8. Coating system №-8 for insulated and non-insulated stainless steel operating in temperature from 120°C to 600°C.

Initial painting and Spot repair painting.

№ of coat	Generic name paint system	DFT ((μm)	Pull off test value (Hydraulic equipment)	Guarantee requirement	Remarks
1	2	3	4	5	6
	Sweet blast with dry, non iron containing abrasive materials, Surface profile: Rz = 25÷50 μm.				
1st	Silicon aluminum	25	N/A	N/A	
2nd	Silicon aluminum	25			
	Total dry film thickness:	**50**			

9. Coating system №-9 for carbon steel operating in temperature less than 400°C.

Initial painting and Spot repair painting.

№ of coat	Generic name paint system	DFT ((μm)	Pull off test value (Hydraulic equipment)	Guarantee requirement	Remarks
1	2	3	4	5	6
	Surface preparation to cleanliness Sa 2.5 ISO 8501-1. Surface profile: Rz = 50÷85 μm.				
1st	Inorganic zinc silicate	65	N/A	N/A	
2nd	Silicon aluminum	25			
3rd	Silicon aluminum	25			
	Total dry film thickness:	**115**			

10. Coating system №-10 for carbon steel operating in temperature 400°C- 600°C.

Initial painting and Spot repair painting.

№ of coat	Generic name paint system	DFT ((μm)	Pull off test value (Hydraulic equipment)	Guarantee requirement	Remarks
1	2	3	4	5	6
	Surface preparation to cleanliness Sa 2.5 ISO 8501-1. Surface profile: Rz = 25÷50 μm.				
1st	Silicon aluminum	25	N/A	N/A	
2nd	Silicon aluminum	25			
3rd	Silicon aluminum	25			
	Total dry film thickness:	**75**			

13. APENDIX 2: COLOR CODE

Unless otherwise noted, the color of the external coatings for different items on the platform shall be specified as followings:

№	Description	Color	RAL code
1	*2*	*3*	*4*
1.	Steel structures, stairs, underside decks, handrails, gas piping, cranes, monorails, jacket, grating deck in the boat landing.	Yellow	RAL 1003
2.	Upside decks, upside helideck, hatch covers, grating decks, skids, lamp posts.	Green	RAL 6032
3.	Wash water, portable water piping.	Light green	RAL 6027
4.	Closed/ open drain piping, instrument air piping, process mixed flows, process liquid.	Grey	RAL 7048
5.	Fire fighting systems.	Red signal	RAL 3001
6.	Steel structures work in high temperature	Silver	-

14. APPENDIX 3: FORMS FOR INSPECTION

Surface preparation and paint application report

COMPANY' NAME	DAILY REPORT FOR PAINT APPLICATION INSPECTION	Report 1

Paint manufacturer:			Paint Item		
Test place:			Coating system		
Test date:			Required DFT: …		
PAINT INSPECTION RESULTS					
Surface preparation:					
Cleaning time:					
Cleaning method:					
Abrasive type:					
Blasting pressure:					
Surface profile:					
Cleaning grade:					
Approval for painting:					
Paint application:					
	1st coat	**2nd coat**	**3rd coat**	…	
Paint application time:					
Paint spray method:					
Needled tip size:					
Pressure used:					
Paint applied:					
Batch № of base:					
Batch № of hardener:					
Batch № thinner:					
Wet film thickness:					
Dry film thickness:					
Visual paint inspection:					
Painting condition:					
Relative humidity:					
Dew point:					
Surface temperature:					
Note:					

Paint Manufacturer's Representative	Checked and verified by	
	Contractor's QC	COMPANY' Representative

Surface preparation and paint application report

COMPANY' NAME	ADHESIVE STRENGTH INSPECTION REPORT	Report 2

Paint manufacturer:	Paint item
Test place:	Coating system
Adhesive resin:	Date dollies attached:
Adhesive tester: Hydraulic	Date dollies pulled out:

ADHESIVE STRENGTH TEST RESULTS

Coating layers & Dolly positions		Dry Film THK. (Microns)		Adhesion Strength (MPa)		Failure mode
		Before sanding	After sanding	Unit	Average	
1st coat:	A1					
	A2					
	A3					
2nd coat:	B1					
	B2					
	B3					
3rd coat:	C1					
	C2					
	C3					

Remark: Adhesion strength of coatings is measured according to the standard ASTM D 4541.

Note:

Paint Manufacturer's Representative	Checked and verified by	
	Contractor's QC	COMPANY' Representative

Surface preparation and paint application report

COMPANY' NAME	REPORT FOR HOLIDAY INSPECTION	Report 3

Paint manufacturer:	Paint item
Test place:	Coating system
Test date:	Required DFT:

HOLIDAY INSPECTION RESULTS

Coating systems	Measured DFT (Micron)	Applied Voltage (KV)	Results	Remarks
Coating system 1:				
Coating system 2:				
Coating system 3:				
Remark:	Voltage applied for holiday test shall be selected according to standard the NACE RP 0188-88.			

Note:

Paint Manufacturer's Representative	Checked and verified by	
	Contractor's QC	COMPANY' Representative

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PIPE SUPPORT STANDARD - DRAWING INDEX

No.	DRAWING No.	DRAWING TITLE	SYMBOL	REMARK
1	SHEET 02/47	PIPE SUPPORT STANDARD - GENERAL NOTES	-	update
2	SHEET 03/47	PIPE SUPPORT STANDARD - ALLOWABLE PIPE SPANS AND SPACING	-	update
3	SHEET 04/47	PIPE SUPPORT STANDARD - ISOLATION STANDARD PAD	PS01	-
4	SHEET 05/47	PIPE SUPPORT STANDARD - ISOLATION I-ROD PAD	PS02	-
5	SHEET 06/47	PIPE SUPPORT STANDARD - WEAR PAD	PS03	-
6	SHEET 07/47	PIPE SUPPORT STANDARD - SADDLE PLATE	PS04	-
7	SHEET 08/47	PIPE SUPPORT STANDARD - U-BOLT ANCHOR	PS05	type A: normal pipe
8	SHEET 09/47	PIPE SUPPORT STANDARD - U-BOLT ANCHOR FOR PIPE WITH COMPOSITE ADDED	PS05	type B: New
9	SHEET 10/47	PIPE SUPPORT STANDARD - U-BOLT GUIDE	PS06	type A: normal pipe
10	SHEET 11/47	PIPE SUPPORT STANDARD - U-BOLT GUIDE FOR PIPE WITH COMPOSITE ADDED	PS06	type B: New
11	SHEET 12/47	PIPE SUPPORT STANDARD - U-BOLT GUIDE WITH WEAR PAD	PS07	-
12	SHEET 13/47	PIPE SUPPORT STANDARD - U-BOLT/CLAMP FOR CU-NI PIPES	PS08	update (2 type U-bolt guide)
13	SHEET 14/47	PIPE SUPPORT STANDARD - GUIDE CLAMP FOR GRE PIPE	PS09	-
14	SHEET 15/47	PIPE SUPPORT STANDARD - CLAMP	PS10	-
15	SHEET 16/47	PIPE SUPPORT STANDARD - CLAMP FOR STANCHION	PS11	-
16	SHEET 17/47	PIPE SUPPORT STANDARD - PIPE SHOE INSULATED	PS12	-
17	SHEET 18/47	PIPE SUPPORT STANDARD - PIPE SHOE SLOPING	PS13	-
18	SHEET 19/47	PIPE SUPPORT STANDARD - PIPE CLAMPED SHOE	PS14	-
19	SHEET 20/47	PIPE SUPPORT STANDARD - PIPE GUIDE	PS15	-
20	SHEET 21/47	PIPE SUPPORT STANDARD - PIPE SHOE GUIDE	PS16	-
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22	SHEET 23/47	PIPE SUPPORT STANDARD - PIPE HOLD DOWN	PS18	-
23	SHEET 24/47	PIPE SUPPORT STANDARD - PIPE LINE/SHOE STOP	PS19	-
24	SHEET 25/47	PIPE SUPPORT STANDARD - VERTICAL PIPE GUIDE	PS20	-
25	SHEET 26/47	PIPE SUPPORT STANDARD - VERTICAL PIPE STOP	PS21	-
26	SHEET 27/47	PIPE SUPPORT STANDARD - CANTILEVER BRACKET	PS22	-
27	SHEET 28/47	PIPE SUPPORT STANDARD - CANTILEVER BRACKET WITH BRACING	PS23	-
28	SHEET 29/47	PIPE SUPPORT STANDARD - T-POST	PS24	-
29	SHEET 30/47	PIPE SUPPORT STANDARD - INVERTED T-POST	PS25	-
30	SHEET 31/47	PIPE SUPPORT STANDARD - RIGHT ANGLE SUPPORT	PS26	-
31	SHEET 32/47	PIPE SUPPORT STANDARD - INVERTED RIGHT ANGLE SUPPORT	PS27	-
32	SHEET 33/47	PIPE SUPPORT STANDARD - GOAL POST TYPE	PS28	-
33	SHEET 34/47	PIPE SUPPORT STANDARD - INVERTED GOAL POST TYPE	PS29	-
34	SHEET 35/47	PIPE SUPPORT STANDARD - RIGHT ANGLE BRACKET	PS30	-
35	SHEET 36/47	PIPE SUPPORT STANDARD - PIPE STANCHION	PS31	-
36	SHEET 37/47	PIPE SUPPORT STANDARD - CLAMPED PIPE STANCHION	PS32	-
37	SHEET 38/47	PIPE SUPPORT STANDARD - ELBOW SUPPORT	PS33	-
38	SHEET 39/47	PIPE SUPPORT STANDARD - ADJUST STANCHION	PS34	-
39	SHEET 40/47	PIPE SUPPORT STANDARD - ADJUST BASE	PS35	-
40	SHEET 41/47	PIPE SUPPORT STANDARD - VERTICAL PIPE TRUNNION	PS36	-
41	SHEET 42/47	PIPE SUPPORT STANDARD - DUMMY LEG	PS37	-
42	SHEET 43/47	PIPE SUPPORT STANDARD - VARIABLE SPRING HANGER	PS38	-
43	SHEET 44/47	PIPE SUPPORT STANDARD - CONSTANT SPRING HANGER	PS39	-
44	SHEET 45/47	PIPE SUPPORT STANDARD - FLANGE (FLANGED VALVE) SUPPORT	PS40	-
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46	SHEET 47/47	PIPE SUPPORT STANDARD - SUPPORT TRIMMER DETAILS	PS42	-

Signed by: Phạm Hồng Quang
Date: 29/10/2021 10:09:11
Certified by: Vietsovpetro CA

Signed by: Lương Thuỳ Dương
Date: 29/10/2021 10:12:44
Certified by: Vietsovpetro CA

Signed by: Nguyễn Tấn Hải
Date: 29/10/2021 11:29:19
Certified by: Vietsovpetro CA

Signed by: Trần Duy Hải
Date: 29/10/2021 15:16:05
Certified by: Vietsovpetro CA

Signed by: Bùi Trọng Hân
Date: 31/10/2021 11:21:16
Certified by: Vietsovpetro CA

NOTES:

UPDATE REV.2:
- ADD MAX. SPAN FOR GRE PIPE.
- FOR PROTECTION OF PIPING SYSTEMS (PIPE 2" ABOVE) FROM CORROSION UNDER SUPPORTS, COMPOSITE APPLICATION (total coated ~2.5mm thickness) SHOULD BE ADDED BY ANTI-CORROSION DEPARTMENT. UPDATE DIMENSION U-BOLT FOR THESE CASE (U-BOLT TYPE B).

FOR APPLIED PROJECT				FOR TYPICAL DRAWING							
PROJECT:											
DRAW. NO.:											
DATE:				2	27.10.21	IFA	P.H.QUANG	L.T.DUONG	N.T.HAI	T.D.HAI	B.T.HAN
				1	02.06.21	IFA	P.H.QUANG	L.T.DUONG	N.T.HAI	T.D.HAI	B.T.HAN
				0	10.01.20	IFA	P.H.QUANG	L.T.DUONG	N.T.HAI	T.D.HAI	B.T.HAN
CHECKED	DEPT.MGR	ENG.MGR	PRO.MGR	REV.	DATE	DES.	PREPARED	CHECKED	DEPT.MGR	ENG.MGR	PRO.MGR

CONTROLLED

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01 | SCALE: -

DRAWING TITLE: PIPE SUPPORT STANDARD | SHEET: 01/47

PHASE: DE

VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

FORMAT: A3

1. SCOPE:

STANDARD SUPPORTS AS INCLUDED HEREIN SHALL BE USED WHERE POSSIBLE. SPECIAL SUPPORTS SHALL BE USED WHEN THE LOADING OR DIMENSIONAL CRITERIA OF STANDARD SUPPORTS ARE EXCEEDED.

ALL SPECIAL SUPPORTS SHALL BE DETAILED SEPARATELY ON SPECIAL PIPE SUPPORT DRAWINGS. ALL SUPPORTS STEEL OR STIFFENING SHALL BE FIELD CHECKED BY FABRICATOR AFTER INSTALLATION AND ADD ANY NECESSARY REINFORCEMENT, BRACING OR STIFFENERS.

2. DIMENSIONS AND UNITS:

UNLESS NOTED OTHERWISE, ALL UNITS IN MILLIMETER (mm) , ALL LOADS IN KILOGRAMS (kg).

3. LOCATION:

SUPPORT LOCATIONS SHALL BE AS PER PIPE SUPPORT LOCATION PLAN AND ISOMETRIC DRAWING.
ALL LOCATIONS SHALL BE FIELD CHECKED PRIOR TO INSTALLATION OF SUPPORTS.
ALL "SITE ADJUST" DIMENSIONS (MARKED WITH " * ") SHALL BE FIELD CHECKED PRIOR TO INSTALLATION.
OVER-LENGTH ALLOWANCES SHALL BE MADE WHERE REQUIRED.

4. ALLOWABLE LOADS:

ALLOWABLE LOADS FOR PIPE SUPPORT STRUCTURAL MEMBER CALCULATED BASED ON MAXIMUM ALLOWABLE STRESS AS PER AISC STEEL CONSTRUCTION HANDBOOK, WITH A REDUCTION FACTOR OF 0.8.
FABRICATOR MAY SUBSTITUTE THICKER MATERIAL AND/OR HEAVIER SECTIONS AT HIS DISCRETION.

5. MATERIALS:

MATERIALS SHALL BE AS SPECIFIED IN THE PIPE SUPPORT STANDARDS OR SPECIAL PIPE SUPPORT DRAWING AS APPROPRIATE. ALL STRUCTURAL STEEL SECTIONS SHALL COMPLY WITH STRUCTURAL STEEL MATERIALS (A36). PIPE SUPPORT DETAILS FOR WELDED ATTACHMENTS, WHICH ARE WELDED DIRECTLY TO PIPE (SUCH AS SADDLE, REINFORCING PAD, LINE STOPS), ARE USED FROM:

- FOR WELD TO CARBON STEEL PIPE: PLATES A516 GR.60/GR.70; OR CUT FROM PIPE A106 GR.B.
- FOR WELD TO LOW TEMP CARBON STEEL PIPE: PLATES A516 GR.60/GR.70 (IMPACT TESTED AT -50°C); OR CUT FROM PIPE A333 GR.6;
- FOR WELD TO STAINLESS STEEL PIPE: PLATES A240 TP316/316L; OR CUT FROM PIPE A312-TP316.
- FOR WELD TO 90CU-10NI PIPE: PLATES B171 UNS C70600;OR CUT FROM PIPE B466 UNS C70600.

6. CORROSION PROTECTION:

ALL SURFACE TREATMENT AND PAINTING SHALL BE IN ACCORDANCE WITH THE PROJECT COATING SPECIFICATION.
TO AVOID ELECTROLYTIC CORROSION BY THE CONTACT OF 02 DIFFERENCE METALS (BOLT / U-BOLT AND STRUCTURAL SUPPORT MEMBER), USE MORE INSULATED BUSHING AT THESE LOCATION. REFER PS-05 TO PS-09 FOR MORE INFORMATION.

COMPOSITE APPLICATION (total coated ~2.5mm thickness, ANTICORROSION SCOPE) SHOULD BE ADDED FOR PROTECTION OF PIPING SYSTEMS (PIPE 2" ABOVE) FROM CORROSION UNDER SUPPORTS. 2

7. IDENTIFICATION:

ALL SUPPORTS SHALL BE IDENTIFIED WITH PIPE SUPPORT NUMBER.
ALL PIPE SUPPORTS WILL BE IDENTIFIED AS PER LIST BELOW:

- PSA : PIPE SUPPORTS ASSEMBLY;
- PS : PIPE SUPPORTS STANDARD;
- SPS : SPECIAL PIPE SUPPORTS.

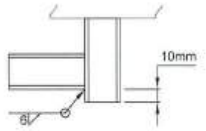
ALL PIPE SUPPORTS ARE SHOWN ON THE PIPE SUPPORT LOCATION PLANS AND ISOMETRIC DRAWINGS AND ARE NUMBERED AS PER THE FOLLOWING:

- FOR INTERCONNECTION PIPING: PSA - AAAA - XX - YY (EXAMPLE: PSA - BK21 - PG - 01)
  (LOCATION) WELLHEAD PLATFORM
  SERVICE CODE
  (2 DIGIT SEQUENTIAL NO.)
- FOR WELLHEAD CONNECTION PIPING: PSA - WELL No. - XX - YY (EXAMPLE: PSA - 21001 - CO - 01)
  SERVICE CODE
  (2 DIGIT SEQUENTIAL NO.)
- FOR PIPING IN THE SKID: PSA - AAAA - SKZZ - YY (EXAMPLE: PSA - BK21 - SK08 - 01)
  (LOCATION) WELLHEAD PLATFORM
  SKID + SYSTEM CODE
  (2 DIGIT SEQUENTIAL NO.)

IN CASE OF SUPPORT FOR MANY DIFFERENT PIPING SYSTEMS SERVICE, SERVICE CODE FOR SUPPORT WILL BE REPRESENTED BY THE SERVICE WITH THE LARGEST PIPE SIZES.
SERVICE CODE & SYSTEM CODE REFER BESIDE TABLES AND P&ID FOR MORE INFORMATION.

8. FABRICATION:

ALL HOLES SHALL BE DRILLED. BURNING IS NOT PERMITTED.
ALL STRUCTURAL COMPONENTS SHALL BE FABRICATED IN ACCORDANCE WITH STRUCTURAL WELDING AND INSPECTION.
ALL WELDS TO BE CONTINUOUS. ALL WELDS TO BE 6mm FILLET UNLESS NOTED OTHERWISE.



NDT REQUIREMENTS TO BE SAME AS FOR MODULE STRUCTURAL FABRICATION.
ALL SHARP CORNERS SHALL BE ROUNDED OFF.
DO NOT SUPPORT ON GRATING. FABRICATOR TO PROVIDE CROSS BEAM AS REQUIRED AND CUT GRATING ACCORDINGLY. SUPPORT ON DECK PLATE TO BE STRENGTHENED BY CROSS BEAM.
SHIMMING AND TEMPORARY SUPPORT INSTALLATION, IF REQUIRED DURING CONSTRUCTION AND PRESSURE TESTING IS IN THE SCOPE OF SUPPORT FABRICATOR.
ALL WELDING OF DISSIMILAR MATERIAL SHALL BE COVERED BY SPECIFIC WELDING PROCEDURE.

9. WELDED ATTACHMENTS:

ALL ATTACHMENTS WELDED DIRECTLY TO PIPING SHALL BE OF A COMPATIBLE MATERIAL SPECIFICATION TO THE PARENT PIPE MATERIAL. FABRICATOR SHALL ENSURE THAT SUCH WELDING IS PERFORMED PRIOR TO PIPING POST WELD HEAT TREATMENT (WHERE APPLICABLE) AND/OR HYDROSTATIC TESTING.
ALL SADDLE PLATES WELDED TO PIPE SHALL BE EQUIPPED WITH A Ø6mm VENT HOLE. THIS HOLE SHALL BE PLUGGED WITH SILICON SEALANT OR PLASTIC PLUG AFTER TESTING.

SERVICE CODE	SERVICE IDENTIFICATION
AI / AU	INSTRUMENT AIR / UTILITY AIR
BD	BLOW DOWN
CH	CHEMICAL INJECTION
CI	CORROSION INHIBITOR
CO	CRUDE OIL
DC	CLOSED DRAIN
DH	OPEN HAZARDOUS DRAIN
DN	OPEN NON-HAZARDOUS DRAIN
FF / FM / FW	FOAM / FM-200 / FIRE WATER
FG	FUEL GAS
FL	FLARE
GL	GASLIFT
NT	NITROGEN
OL	LUBE OIL
PG / PL	PROCESS GAS / PROCESS LIQUID
RL	RELIEF GAS
SW	SEWAGE
VA	ATMOSPHERIC VENT
VE	EXHAUST VENT
VT	VENT
WB/WC/WG	BLACK/ COOLING/ GREY WATER
WI	INJECTION WATER
WW	WASHING WATER SYSTEM
.....	.....

SYSTEM CODE	SYSTEM OR SKID
00	WELLHEAD (WH)
02	VENT SCRUBBER/ CLOSED DRAIN TANK
03	OPEN DRAIN SYSTEM
04	PRODUCTION SEPARATOR
05	COMPRESSED AIR RECEIVER / AIR COMPRESSOR SKID
06	OIL HEATING SYSTEM
07	CHEMICAL DEPRESSANT / DEMULSIFIER STORAGE / INJ. PUMPS
08	GASLIFT DISTRIBUTION SYSTEM
09	RISER
10	INLET MANIFOLD
11	SLUG CATCHER
12	MULTIPHASE FLOW METER
13	WATER INJECTION AND WASHING PIPELINE WATER
21	Inlet Scrubber / Compressor 1st Stage / Interstage Coller
22	Interstage Scrubber / Compressor 2nd Stage / Discharge Coller
42	PRODUCED WATER TREATMENT
....	.....
80	WASHING WATER SYSTEM
81	SEWAGE SYSTEM
82	DECK DRAIN SYSTEM
83	FUEL OIL
86	LUBE OIL
87	OIL DRAIN
88	EXHAUST SYSTEM

NOTES:

1. FOR GENERAL NOTES REFER TO SHEET 2.
2. ISOLATION PAD TO BE BONDED TO STRUCTURAL STEEL.
3. ISOLATION PAD WIDTH SHOULD BE SAME AS WIDTH OF STRUCTURAL STEEL MEMBER.
4. USE UP TO THREE STRIPS OF I-ROD TO MEET LOAD REQUIREMENTS.
5. I-ROD LENGTH "B" DIMENSIONS MAY BE INCREASED (SUPPORT IS USED FOR PIPES GROUP) OR DECREASED IF REQUIRED WHEN INDICATED ON PIPE SUPPORT DETAIL DRAWING.
6. I-ROD ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
7. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.

CONTROLLED

Signed by: Phạm Hồng Quảng
Date: 29/10/2021 10:59:10
Certified by: Vietsovpetro C.A

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.06.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01

DRAWING TITLE: PIPE SUPPORT STANDARD GENERAL NOTES

SCALE: -
SHEET: 02/47
PHASE: DE

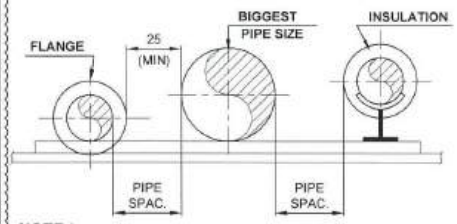
VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

10. ALLOWABLE PIPE SUPPORT SPACING:

ALLOWABLE PIPE SUPPORT SPACING

PIPE SIZE (inch)	PIPE SPACING (mm)	MAX. SPANS (m) FOR STRAIGHT RUN PIPES EXCLUDING FITTINGS (*)			
		STEEL	SS	Cu Ni	GRE (*)
1/2"	50	2.1	2.2	1.8	-
3/4"	50	2.5	2.5	2.0	-
1"	50	3.1	3.2	2.3	2.5
1 1/2"	50	3.8	3.9	2.7	2.9
2"	50	4.3	4.4	3.1	3.1
2 1/2"	50	5.0	5.2	3.5	3.5
3"	50	5.5	5.7	4.0	4.0
4"	50	6.0	6.3	4.3	4.3
6"	75	7.2	7.5	4.5	4.5
8"	75	7.4	6.0	5.0	5.0
10"	90	7.8	6.6	5.5	5.7
12"	90	8.1	7.1	6.0	6.2
14"	90	9.1	7.4	6.0	6.4
16"	110	9.3	7.5	6.0	6.9
18"	110	9.5	-	-	7.3
20"	110	10.5	-	-	7.7
24"	160	10.8	-	-	8.4
26"	160	12.3	-	-	9.0
28"	160	12.5	-	-	9.3

NOTE : IN CASE OF UNSPECIFIED PIPE THICKNESS.
(*): SPAN FOR GRE PIPE BE ONLY FOR REFERENCE, WILL BE BASED ON MANUFACTURER'S RECOMMENDATION. (2)



NOTE *:
- THE MAX. SPAN GIVEN IN TABLE FOR STEEL PIPE, IS BASED ON USING THE THINNEST WALL THICKNESS FROM BESIDE TABLE WITH INSULATION (DENSITY ASSUME 150kg/m^3) COATING AND FULL FILL WATER.
- THE RECOMMENDED MAX. SPAN ENSURES THAT THE PIPE BENDING STRESSES DO NOT EXCEED MINIMUM YIELD STRENGTH DUE TO SELF WEIGHT OF PIPE, COATING AND WATER INSIDE.
- MATERIAL PIPE USED:
  + CARBON STEEL (CS): A106 GR.B
  + LOW TEMP CARBON STEEL (LTCS) : A333 GR.6
  + STAINLESS STEEL (SS): A312-TP316
  + 90CU-10NI (Cu Ni): B466 UNS C70600
- THE MAX SPAN FOR POLYPROPYLENE RANDOM (PPR) or GRE PIPE IS BASED ON MANUFACTURER'S RECOMMENDATION.

MAX. SPANS (m) FOR STRAIGHT STEEL PIPE (CS, LTCS, SS), COATING AND FILLED WITH WATER

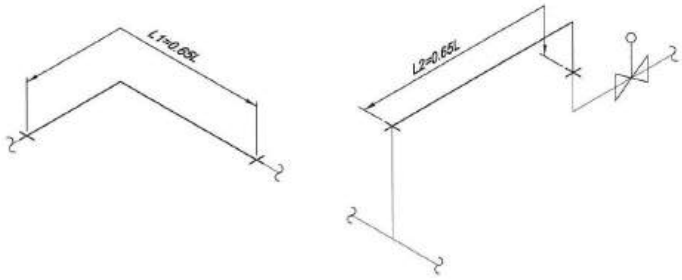
PIPE SIZE		OUT. DIAM.	COAT. THK.	PIPE, COATING (DENSITY 150kg/m^3) AND FULL FILL SEA WATER TREATMENT (DENSITY 1025kg/m^3) Sch: PIPE SCHEDULE												
				Sch 20	Sch 30	Sch STD	Sch 40S	Sch 40	Sch 60	Sch XS	Sch 80S	Sch 80	Sch 100	Sch 120	Sch 160	Sch XXS
inch	DN	mm	mm	MAX. SPANS (m)												
1/2"	15	21.3	25			2.1	2.2	2.1		2.3	2.4	2.3			2.4	2.3
3/4"	20	26.7	25			2.5	2.5	2.5		2.8	2.8	2.8			2.9	2.8
1"	25	33.4	25			3.1	3.2	3.1		3.3	3.3	3.3			3.4	3.3
1 1/2"	40	48.3	25			3.8	3.9	3.8		4.1	4.1	4.1			4.2	4.2
2"	50	60.3	25			4.3	4.4	4.3		4.7	4.6	4.7			4.8	4.8
2 1/2"	65	73.0	25			5.0	5.2	5.0		5.3	5.5	5.3			5.5	5.4
3"	80	88.9	25			5.5	5.7	5.5		5.9	6.1	5.9			6.1	6.1
4"	100	114.3	40			6.0	6.3	6.0		6.6	6.8	6.6		6.8	6.9	6.9
6"	150	168.3	40			7.2	7.5	7.2		8.0	8.4	8.0		8.4	8.5	8.6
8"	200	219.1	50	7.4	7.7	8.1	8.4	8.1	8.7	9.1	9.4	9.1	9.3	9.6	9.8	9.7
10"	250	273.1	50	7.8	8.5	9.0	9.4	9.0	9.8	9.8	10.2	10.2	10.5	10.8	11.0	10.9
12"	300	323.9	50	8.1	9.1	9.5	9.9	9.8	10.7	10.4	10.8	11.1	11.5	11.8	12.0	11.8
14"	350	355.6	50	9.1	9.7	9.7		10.2	11.1	10.6		11.7	12.1	12.3	12.6	
16"	400	406.4	50	9.3	10.0	10.0		11.0	11.9	11.0		12.5	12.9	13.2	13.5	
18"	450	457.0	50	9.5	10.9	10.3		11.8	12.7	11.4		13.3	13.8	14.1	14.3	
20"	500	508.0	50	10.5	11.7	10.5		12.3	13.4	11.7		14.1	14.5	14.8	15.1	
24"	600	610.0	50	10.8	12.6	10.8		13.5	14.7	12.1		15.4	16.0	16.3	16.6	
26"	650	660.0	70	12.3		10.9				12.2						
28"	700	711.0	70	12.5	13.5	11.0				12.4						

NOTE : MASS OF PIPE FITTINGS AND VALVES NOT INCLUDED.

11. EQUIVALENT STRUCTURAL STEEL:

AS PER PIPE SUPPORT STANDARD	CODE IN STANDARD	AS PER UK STANDARD	AS PER TCVN / JIS STANDARD
L2x2x3/16	L2	L50x50x6	L50x50x6
L3x3x1/4	L3	L75x75x8	L75x75x8
C6x13	C6	CH152x76x18	C150x75x6x10
W6x15	W6	UC152x152x23	H150x150x7x10
-	-	-	H200x150x6x9
W8x31	W8	UC203x203x46	H200x200x8x12

12. SHAPE FACTORS:



Signed by: Pham Hồng Quang
Date: 29/10/2021 10:09:14
Certified by: Vietsovpetro CA

NOTES:

CONTROLLED

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.06.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01 | SCALE: -

DRAWING TITLE: PIPE SUPPORT STANDARD ALLOWABLE PIPE SPANS AND SPACING | SHEET: 03/47 | PHASE: DE

FORMAT: A3

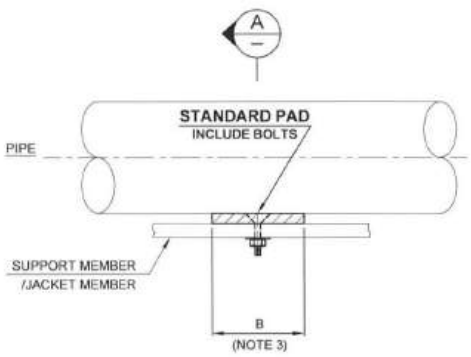
VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

FORMAT: A3

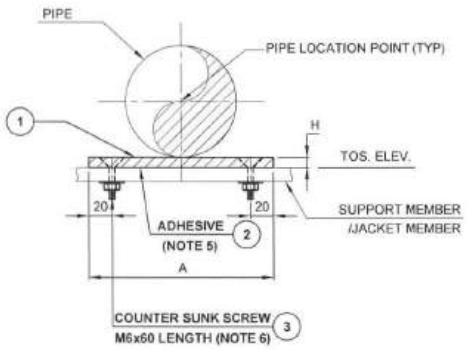
STANDARD PAD

SUPPORT MATERIAL			
ITEM	DESCRIPTION	QTY	MATERIAL
1	Isolation Pad	01 pc	Neoprene/PTFE
2	Adhesive (note 5)	-	-
3	Counter Sunk Screw, M6x60 c/w nuts & spring washers	02 pcs	SS316, PTFE coated (note 6)

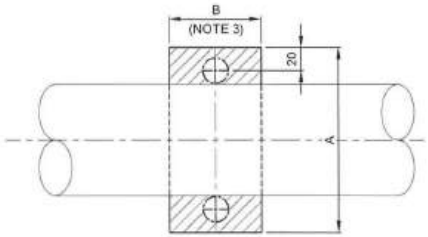
ELEVATION



SECTION A



PLAN



PIPE SIZE		OUTSIDE DIA.	STANDARD PAD		
			LENGTH	WIDE	HEIGHT
			A	B	H
inch	DN	mm	mm	mm	mm
1/2"	15	Ø21.3	100	30	10
3/4"	20	Ø26.7	100	30	10
1"	25	Ø33.4	120	30	10
1 1/2"	40	Ø48.3	150	30	10
2"	50	Ø60.3	180	30	10
2 1/2"	65	Ø73.0	200	30	10
3"	80	Ø88.9	220	30	10
4"	100	Ø114.3	250	30	10
6"	150	Ø168.3	280	60	10
8"	200	Ø219.1	300	60	10
10"	250	Ø273.1	320	60	10
12"	300	Ø323.9	350	60	10
14"	350	Ø355.6	380	60	10
16"	400	Ø406.4	400	60	10
18"	450	Ø457.0	400	60	10
20"	500	Ø508.0	450	60	10
24"	600	Ø610.0	450	60	10
26"	650	Ø660.0	500	60	10
28"	700	Ø711.0	500	60	10

Signed by: Pham Hồng Quang
Date: 29/10/2021 10:09:20
Certified by: Vietsovpetro CA

NOTES:

1. FOR GENERAL NOTES REFER TO SHEET 2.
2. ISOLATION PAD TO BE BONDED TO STRUCTURAL STEEL.
3. ISOLATION PAD WIDTH SHOULD BE SAME AS WIDTH OF STRUCTURAL STEEL MEMBER. DIMENSIONS MAY BE INCREASED OR DECREASED IF REQUIRED WHEN INDICATED ON PIPE SUPPORT DETAIL DRAWING.
4. NEOPRENE ISOLATION PAD IS SUITABLE FOR DESIGN TEMPERATURE -30°C TO 100°C ONLY. FOR TEMPERATURE BELOW -30°C AND ABOVE 100°C (LIMITING 230°C), PTFE ISOLATION PAD TO BE USED. FOR TEMPERATURE HIGHER THAN 230°C, SADDLE PLATE (PS-04) IS REQUIRED.
5. ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY CONSTRUCTION CONTRACTOR.
6. COUNTER SUNK SCREWS SHALL BE SS316 C/W NUTS & SPRING WASHERS, PTFE COATED (OR SAME COATED WITH PIPING STUD BOLT OF APPLIED PROJECT).

CONTROLLED

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.06.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01

DRAWING TITLE: PIPE SUPPORT STANDARD ISOLATION STANDARD PAD - PS01

SCALE: -

SHEET: 04/47

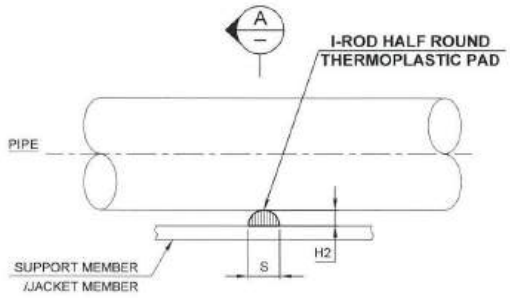
PHASE: DE

VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

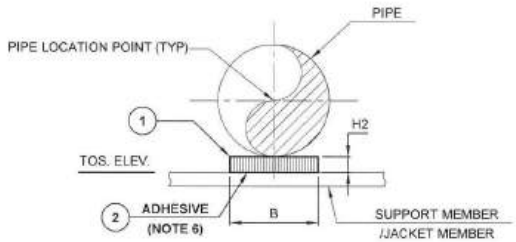
I-ROD BY THE FOOT

SUPPORT MATERIAL			
ITEM	DESCRIPTION	QTY	MATERIAL
1	Half-round Pad of I-Rod	see table	Thermal Plastic
2	Adhesive (note 6)	-	-

ELEVATION

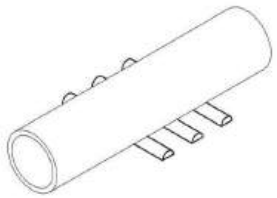


SECTION A



PIPE SIZE		OUTSIDE DIA.	I-ROD			QTY
			LENGTH	SIZE	HEIGHT	(Special
			B	S	H2	case)
inch	DN	mm	mm	mm	mm	pcs
1/2"	15	Ø21.3	60	20	10	2
3/4"	20	Ø26.7	70	20	10	2
1"	25	Ø33.4	76	25	12.5	2
1 1/2"	40	Ø48.3	102	25	12.5	2
2"	50	Ø60.3	114	25	12.5	2
2 1/2"	65	Ø73.0	128	25	12.5	2
3"	80	Ø88.9	152	25	12.5	2
4"	100	Ø114.3	178	25	12.5	2
6"	150	Ø168.3	230	25	12.5	2
8"	200	Ø219.1	280	25	12.5	2
10"	250	Ø273.1	344	38	19	3
12"	300	Ø323.9	406	38	19	3
14"	350	Ø355.6	432	38	19	3
16"	400	Ø406.4	484	38	19	3
18"	450	Ø457.0	550	38	19	3
20"	500	Ø508.0	600	38	19	3
24"	600	Ø610.0	700	38	19	3
26"	650	Ø660.0	750	38	19	3
28"	700	Ø711.0	800	38	19	3

I -ROD SIZE	MAX. LOADING	NOTE
3/4" I-Rod	2000 KG	FOR PIPE SIZE 3/4" BELOW
1" I-Rod	3630 KG	FOR PIPE SIZE 1" TO 8"
1 1/2" I-Rod	4535 KG	FOR PIPE SIZE 10" ABOVE



USE UP TO THREE STRIPS OF I-ROD
TO MEET LOAD REQUIREMENTS.

Signed by: Phạm Hồng Quang
Date: 29/10/2021 10:09:08
Certified by: Vietsovpetro CA

NOTES:

1. FOR GENERAL NOTES REFER TO SHEET 2.
2. ISOLATION PAD TO BE BONDED TO STRUCTURAL STEEL.
3. ISOLATION PAD WIDTH SHOULD BE SAME AS WIDTH OF STRUCTURAL STEEL MEMBER.
4. USE UP TO THREE STRIPS OF I-ROD TO MEET LOAD REQUIREMENTS.
5. I-ROD LENGTH "B" DIMENSIONS MAY BE INCREASED (SUPPORT IS USED FOR PIPES GROUP) OR DECREASED IF REQUIRED WHEN INDICATED ON PIPE SUPPORT DETAIL DRAWING.
6. I-ROD ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
7. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.

CONTROLLED

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.06.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE
FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01

DRAWING TITLE: PIPE SUPPORT STANDARD
ISOLATION I-ROD PAD - PS02

SCALE: -
SHEET: 05/47
PHASE: DE

FORMAT: A3

VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

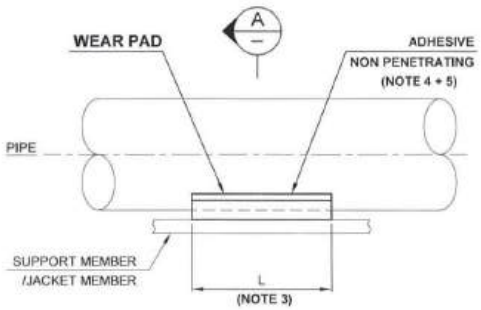
FORMAT: A3

WEAR PAD

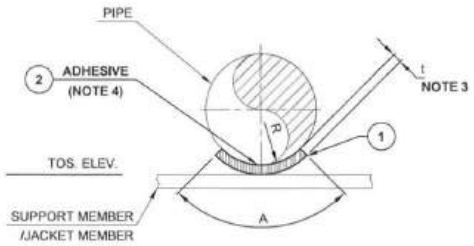
SUPPORT MATERIAL			
ITEM	DESCRIPTION	QTY	MATERIAL
1	Wear Pad	01 pc	Thermal Plastic
2	Adhesive (note 4)	-	-

TYPE A: WEAR PAD

ELEVATION



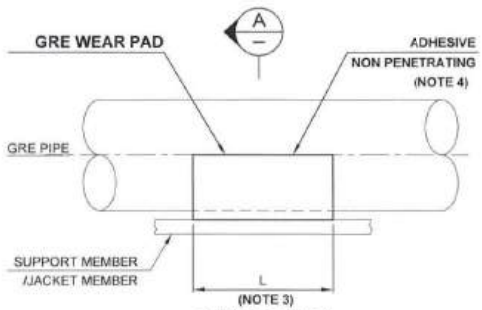
SECTION A



PIPE SIZE		OUTSIDE DIA.	WEAR PAD TYPE A			
			R	A	t	L
inch	DN	mm	mm	degree	mm	mm
1/2"	15	Ø21.3	10.6	90°	6	100 NOTE 3
3/4"	20	Ø26.7	13.3	90°	6	
1"	25	Ø33.4	16.7	90°	6	
1 1/2"	40	Ø48.3	24.1	90°	6	
2"	50	Ø60.3	30.1	90°	6	
2 1/2"	65	Ø73.0	36.5	90°	6	
3"	80	Ø88.9	44.4	90°	6	
4"	100	Ø114.3	57.1	90°	6	
6"	150	Ø168.3	84.1	60°	6	200 NOTE 3
8"	200	Ø219.1	109.5	60°	6	
10"	250	Ø273.1	136.5	60°	6	300 NOTE 3
12"	300	Ø323.9	164.9	30°	6	
14"	350	Ø355.6	177.8	30°	6	
16"	400	Ø406.4	203.2	30°	6	
18"	450	Ø457.0	228.5	30°	6	
20"	500	Ø508.0	254.0	30°	6	
24"	600	Ø610.0	305.0	30°	10	
26"	650	Ø660.0	330.0	30°	10	
28"	700	Ø711.0	355.5	30°	10	

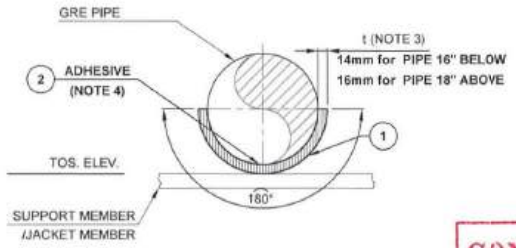
TYPE B: GRE WEAR PAD

ELEVATION



STANDARD LENGTH:
100mm or 150mm

SECTION A



CONTROLLED

Signed by: Phạm Hồng Quang
Date: 29/10/2021 10:09:16
Certified by: Vietsovpetro CA

NOTES:

1. FOR GENERAL NOTES REFER TO SHEET 2.
2. WEAR PAD TO BE BONDED TO PIPE.
3. WEAR PAD LENGTH (L) AND THICKNESS (t) ARE FOR REFERENCE, SHALL BE CONFIRMED BY VENDOR.
4. ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR. ADHESIVE IS USED TO FORM A PERIMETER SEAL AROUND WEAR PADS TO ENSURE A SECURE BOND AND SEAL FOR NONE WATER PENETRATION.
5. IN CASE OF NECESSITY, HEAT SHRINK SLEEVE MAY BE USED TO PROTECT WATERPROOF.

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.06.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01

DRAWING TITLE: PIPE SUPPORT STANDARD WEAR PAD - PS03

SCALE: -

SHEET: 06/47

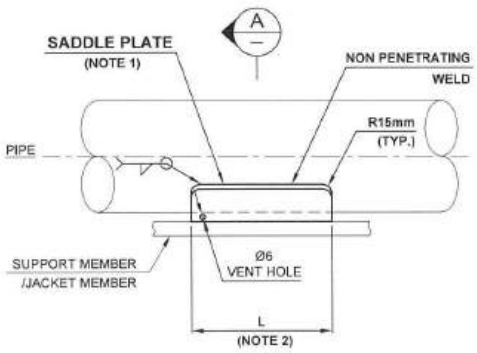
PHASE: DE

VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

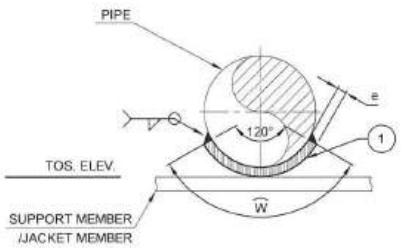
SADDLE PLATE

SUPPORT MATERIAL			
ITEM	DESCRIPTION	QTY	MATERIAL
1	Saddle Plate	01 pc	match to pipe (note 1)

ELEVATION



SECTION A



PIPE SIZE		OUTSIDE DIA.	SADDLE PLATE				
			W	L (mm)			e
inch	DN	mm	mm	Short	Stand.	Long	mm
1/2"	15	Ø21.3	25	50	150	300	
3/4"	20	Ø26.7	30	50	150	300	
1"	25	Ø33.4	35	50	150	300	
1 1/2"	40	Ø48.3	55	50	150	300	
2"	50	Ø60.3	65	100	270	470	
2 1/2"	65	Ø73.0	80	100	270	470	
3"	80	Ø88.9	95	100	270	470	
4"	100	Ø114.3	120	150	320	470	
6"	150	Ø168.3	180	150	320	470	
8"	200	Ø219.1	230	150	320	470	SEE
10"	250	Ø273.1	290	150	320	470	NOTE
12"	300	Ø323.9	340	180	350	650	4
14"	350	Ø355.6	375	180	350	650	
16"	400	Ø406.4	430	180	350	650	
18"	450	Ø457.0	480	180	350	650	
20"	500	Ø508.0	535	350	350	650	
24"	600	Ø610.0	640	350	350	650	
26"	650	Ø660.0	695	350	350	650	
28"	700	Ø711.0	745	350	350	650	

CONTROLLED

Signed by: Phạm Hồng Quang
Date: 29/10/2021 10:09:04
Certified by: Vietsovpetro CA

NOTES:

1. FOR GENERAL NOTES REFER TO SHEET 2.
2. DIMENSION 'L' MAY BE VARIED FROM "STANDARD" & "LONG" VALUES IF REQUIRED OR AS SPECIFIED BY THE STRESS GROUP. DIMENSION 'L' MAY BE REDUCED TO SUIT LENGTH OF STRAIGHT PIPE AVAILABLE AND WHERE THERMAL EXPANSION IS MINIMAL. DIMENSIONS WILL BE INDICATED ON SUPPORT DETAIL DRAWING.
3. VENT HOLE TO BE SEALED AFTER COMPLETION OF PRESS. TESTING BY MASTIC SEAL OR EQUAL.
4. THICKNESS OF SADDLE PLATE "e" SHOULD BE AS FOLLOW:
   - SADDLE FOR PIPE 4" AND BELOW: CUT FROM LINE PIPE (DEPENDING ON THE PIPE PURCHASE).
   - SADDLE FOR PIPE 6" AND ABOVE: CUT FROM 10mm THK. PLATE.
5. IN SOME CASES, FOR CONVENIENCE AND AVOID WASTING AREA, SADDLE FOR 6" ABOVE WILL BE 90°; 60°OR 30° (NOT BE STANDARD 120°), WILL BE INDICATED ON SUPPORT DETAIL DRAWING.

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.05.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE
FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01 | SCALE: -

DRAWING TITLE: PIPE SUPPORT STANDARD SADDLE PLATE - PS04 | SHEET: 07/47 | PHASE: DE

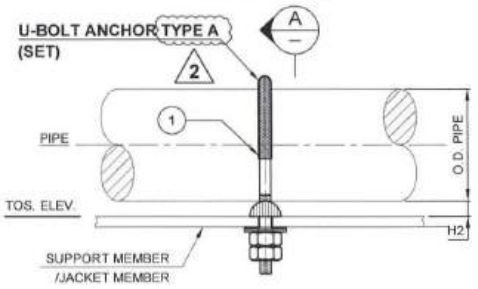
FORMAT: A3

VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

U-BOLT ANCHOR (NORMAL PIPE) 2

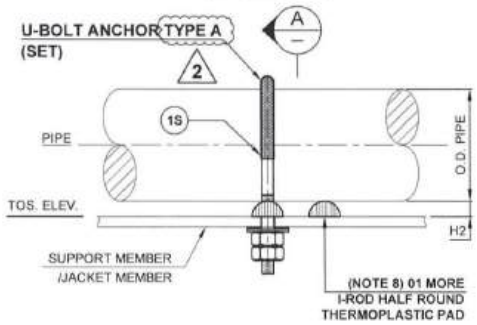
NORMAL CASE

ELEVATION

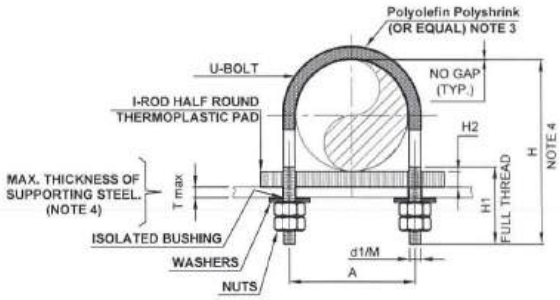


SPECIAL CASE (PIPE 8" ABOVE -Note 8)

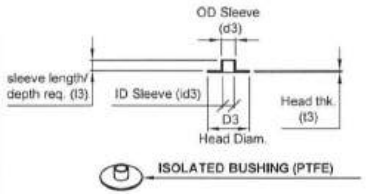
ELEVATION



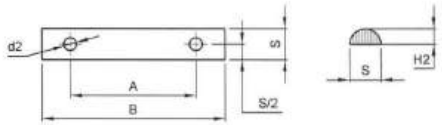
SECTION A



ISOLATED BUSHING



HALF ROUND I-ROD THERMOPLASTIC PAD



SUPPORT MATERIAL- NORMAL CASE

ITEM	DESCRIPTION	QTY	MATERIAL
1	U-bolt type A with Polyshrink, 04 Nuts, Washers, 01 Half Round I-rod Thermoplastic Pad, 02 Isolated Bushing	01 set	-A36: for pipe CS -SS316: for pipe SS PTFE Coated (note 2)

SUPPORT MATERIAL- SPECIAL CASE (NOTE 8)

ITEM	DESCRIPTION	QTY	MATERIAL
1S	U-bolt type A with Polyshrink, 04 Nuts, Washers, 02 Half Round I-rod Thermoplastic Pad, 04 Isolated Bushing	01 set	-A36: for pipe CS -SS316: for pipe SS PTFE Coated (note 2)

PIPE SIZE		T max note 4	U-BOLT (NOTE 3)							I-ROD (NOTE 3)				ISOLATED BUSHING (NOTE 3)				
			d1		A	H	L	H1	MAX. LOAD	B	S	H2	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/2"	Ø21.3	10	1/4"	M6	28	80	190	60	220	60	20	10	9	8	6.1		12.2	2
3/4"	Ø26.7	10	1/4"	M6	34	84	200	60	220	70	20	10	9	8	6.1		12.2	2
1"	Ø33.4	10	3/8"	M10	44	87	220	60	550	76	25	12.5	13	12	10.1		24	2
1 1/2"	Ø48.3	10	3/8"	M10	59	102	260	64	550	102	25	12.5	13	12	10.1		24	2
2"	Ø60.3	10	3/8"	M10	71	114	285	64	550	114	25	12.5	13	12	10.1		24	2
2 1/2"	Ø73.0	16	1/2"	M14	88	133	340	76	1025	128	25	12.5	17	16	14.1	5	30	3
3"	Ø88.9	16	1/2"	M14	104	148	380	76	1025	150	25	12.5	17	16	14.1	to	30	3
4"	Ø114.3	16	1/2"	M14	129	173	445	76	1025	178	25	12.5	17	16	14.1	30	30	3
6"	Ø168.3	16	5/8"	M16	185	241	625	95	1640	230	25	12.5	19	18	16.1	(see	34.5	3
8"	Ø219.1	20	5/8"	M16	236	292	750	95	1640	280	25	12.5	19	18	16.1	requ.	34.5	3
10"	Ø273.1	20	3/4"	M20	294	351	910	102	2460	344	38	19	23	22	20.2	purc.	36	3
12"	Ø323.9	20	7/8"	M24	349	408	1060	108	3420	406	38	19	28	27	24.2	&	44	3
14"	Ø355.6	20	7/8"	M24	381	440	1140	108	3420	432	38	19	28	27	24.2	note	44	3
16"	Ø406.4	20	7/8"	M24	431	491	1270	108	3420	484	38	19	28	27	24.2	3, 4)	44	3
18"	Ø457.0	20	1"	M27	485	551	1430	121	4500	550	38	19	31	30	27.5		50	3
20"	Ø508.0	20	1"	M27	536	602	1560	121	4500	600	38	19	31	30	27.5		50	3
24"	Ø610.0	20	1"	M27	638	703	1820	121	4500	700	38	19	31	30	27.5		50	3
26"	Ø660.0	20	1"	M27	688	754	1950	121	4500	750	38	19	31	30	27.5		50	3
28"	Ø711.0	20	1"	M27	739	805	2080	121	4500	800	38	19	31	30	27.5		50	3

CONTROLLED

Signed by: Pham Hồng Quang
Date: 29/10/2021 10:09:08
Certified by: Vietsovpetro CA

NOTES:

1. FOR GENERAL NOTES REFER TO SHEET 2.
2. U-BOLTS AND NUTS SHALL BE PTFE COATED (OR SAME COATED WITH PIPING STUD BOLT OF APPLIED PROJECT).
3. U-BOLT, I-ROD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION. AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR.
4. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.
5. I-ROD ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
6. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.
7. TO BE USED FOR OPERATING TEMPERATURE RANGE OF -30°C TO 100°C.
8. SPECIAL CASE - (FOR PIPE 8" ABOVE): ADD MORE 01 HALF ROUND I-ROD THERMOPLASTIC PAD ON THE SIDE TO INCREASE SUPPORT LOAD, AND ALSO AS A BACKUP LOCATION FOR INSTALLING EXISTING U-BOLT, WHEN ANTI-CORROSION IS NEEDED AT THIS SIDE SUPPORT POSITION.

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.06.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE
FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01 | SCALE: -

DRAWING TITLE: PIPE SUPPORT STANDARD U-BOLT ANCHOR - PS05 TYPE A - FOR NORMAL PIPE | SHEET: 08/47 | PHASE: DE

FORMAT: A3

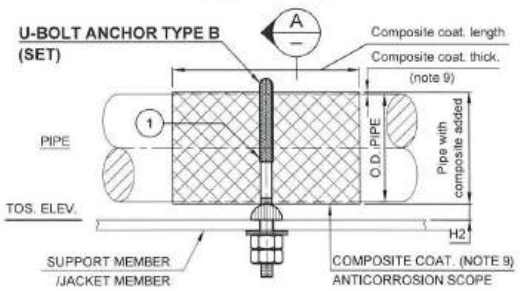
VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

FORMAT: A3

U-BOLT ANCHOR FOR PIPE WITH COMPOSITE ADDED (NOTE 9) 2

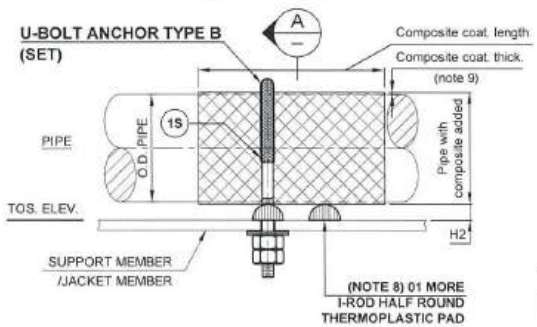
NORMAL CASE

ELEVATION

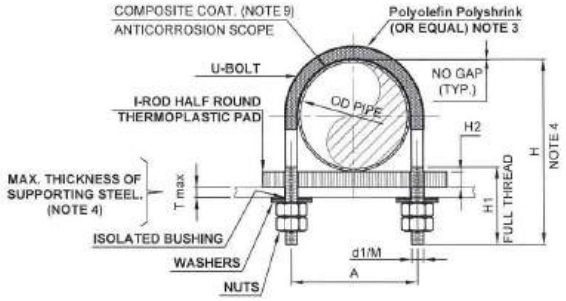


SPECIAL CASE (PIPE 8" ABOVE -Note 8)

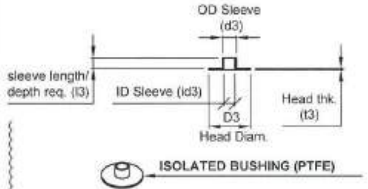
ELEVATION



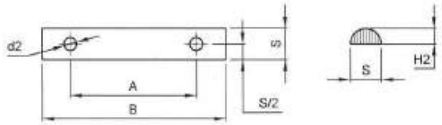
SECTION A



ISOLATED BUSHING



HALF ROUND I-ROD THERMOPLASTIC PAD



SUPPORT MATERIAL- NORMAL CASE

ITEM	DESCRIPTION	QTY	MATERIAL
1	U-bolt type B with Polyshrink, 04 Nuts, Washers, 01 Half Round I-rod Thermoplastic Pad, 02 Isolated Bushing, for pipe with composite added	01 set	-A36: for pipe CS -SS316: for pipe SS PTFE Coated (note 2)

SUPPORT MATERIAL- SPECIAL CASE (NOTE 8)

ITEM	DESCRIPTION	QTY	MATERIAL
1S	U-bolt type B with Polyshrink, 04 Nuts, Washers, 02 Half Round I-rod Thermoplastic Pad, 04 Isolated Bushing, for pipe with composite added	01 set	-A36: for pipe CS -SS316: for pipe SS PTFE Coated (note 2)

U-BOLT ANCHOR FOR PIPE WITH COMPOSITE ADDED (NOTE 9)

PIPE SIZE		T max note 4	U-BOLT (NOTE 3)							I-ROD (NOTE 3)				ISOLATED BUSHING (NOTE 3)				
			d1		A	H	L	H1	MAX. LOAD	B	S	H2	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm
2"	Ø60.3	10	3/8"	M10	76	119	295	64	550	120	25	12.5	13	12	10.1		24	2
2 1/2"	Ø73.0	16	1/2"	M14	93	138	350	76	1025	134	25	12.5	17	16	14.1	5	30	3
3"	Ø88.9	16	1/2"	M14	109	153	390	76	1025	156	25	12.5	17	16	14.1	to	30	3
4"	Ø114.3	16	1/2"	M14	134	178	455	76	1025	180	25	12.5	17	16	14.1	30	30	3
6"	Ø168.3	16	5/8"	M16	190	246	635	95	1640	235	25	12.5	19	18	16.1	(see	34.5	3
8"	Ø219.1	20	5/8"	M16	241	297	760	95	1640	285	25	12.5	19	18	16.1	requ.	34.5	3
10"	Ø273.1	20	3/4"	M20	299	356	920	102	2460	350	38	19	23	22	20.2	purc.	36	3
12"	Ø323.9	20	7/8"	M24	354	413	1070	108	3420	410	38	19	28	27	24.2	&	44	3
14"	Ø355.6	20	7/8"	M24	386	445	1150	108	3420	436	38	19	28	27	24.2	note	44	3
16"	Ø406.4	20	7/8"	M24	436	496	1280	108	3420	490	38	19	28	27	24.2	3, 4)	44	3
18"	Ø457.0	20	1"	M27	490	556	1440	121	4500	550	38	19	31	30	27.5		50	3
20"	Ø508.0	20	1"	M27	541	607	1570	121	4500	600	38	19	31	30	27.5		50	3
24"	Ø610.0	20	1"	M27	643	708	1830	121	4500	700	38	19	31	30	27.5		50	3
26"	Ø660.0	20	1"	M27	693	759	1960	121	4500	750	38	19	31	30	27.5		50	3
28"	Ø711.0	20	1"	M27	744	810	2090	121	4500	800	38	19	31	30	27.5		50	3

CONTROLLED

Signed by: Phạm Hồng Quang
Date: 29/10/2021 10:09:02
Certified by: Vietsovpetro CA

NOTES:

1. FOR GENERAL NOTES REFER TO SHEET 2.
2. U-BOLTS AND NUTS SHALL BE PTFE COATED (OR SAME COATED WITH PIPING STUD BOLT OF APPLIED PROJECT).
3. U-BOLT, I-ROD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION, AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR.
4. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.
5. I-ROD ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
6. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.
7. TO BE USED FOR OPERATING TEMPERATURE RANGE OF -30°C TO 80°C.
8. SPECIAL CASE - (FOR PIPE 8" ABOVE): ADD MORE 01 HALF ROUND I-ROD THERMOPLASTIC PAD ON THE SIDE TO INCREASE SUPPORT LOAD, AND ALSO AS A BACKUP LOCATION FOR INSTALLING EXISTING U-BOLT, WHEN ANTI-CORROSION IS NEEDED AT THIS SIDE SUPPORT POSITION.
9. FOR PROTECTION OF PIPING SYSTEMS (PIPE 2" ABOVE) FROM CORROSION UNDER SUPPORTS, COMPOSITE APPLICATION (TOTAL COATED ~2.5mm THICKNESS) SHOULD BE ADDED WITH LENGTH:
   + PIPE 2" ÷ 6" : LENGTH WILL BE 200mm;
   + PIPE 8" ABOVE : LENGTH WILL BE 300mm;
   + IN SOME SPECIAL CASES (NOT ENOUGH SPACING), THE COMPOSITE LENGTH MAY BE min.100mm.

COMPOSITE COATING SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE 80°C.
THIS COMPOSITE COATING WILL BE SUPPLIED BY ANTI-CORROSION DEPARTMENT (ANTI-CORROSION SCOPE).

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.06.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01 SCALE: -

DRAWING TITLE: PIPE SUPPORT STANDARD
U-BOLT ANCHOR - PS05
TYPE B - FOR PIPE WITH COMPOSITE ADDED

SHEET: 06/47

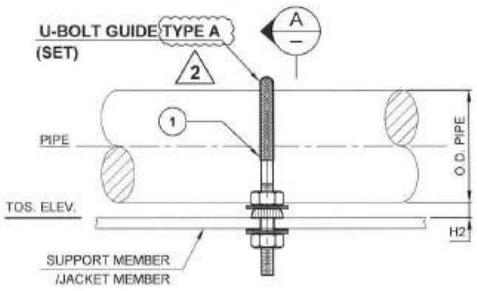
PHASE: DE

VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

U-BOLT GUIDE (NORMAL PIPE) 2

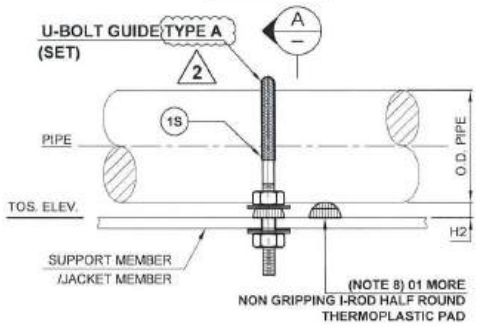
NORMAL CASE

ELEVATION

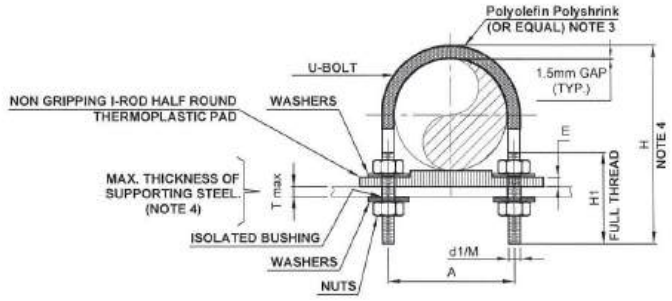


SPECIAL CASE (PIPE 8" ABOVE -Note 8)

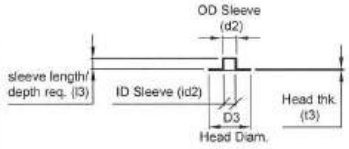
ELEVATION



SECTION A

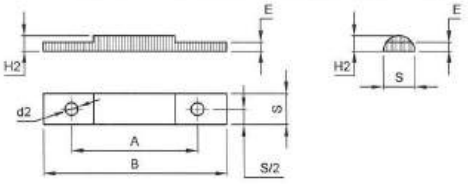


ISOLATED BUSHING



ISOLATED BUSHING (PTFE)
Can be installed from the top
(through i-rod + structural support member,
sleeve length / depth required increases), Vendor Advice

NON-GRIPPING HALF ROUND I-ROD THERMOPLASTIC PAD



SUPPORT MATERIAL- NORMAL CASE

ITEM	DESCRIPTION	QTY	MATERIAL
1	U-bolt type A with Polyshrink, 04 Nuts, Washers, 01 Non-gripping Half Round I-rod Thermoplastic Pad, 02 Isolated Bushing	01 set	-A36: for pipe CS -SS316: for pipe SS PTFE Coated (note 2)

SUPPORT MATERIAL- SPECIAL CASE (NOTE 8)

ITEM	DESCRIPTION	QTY	MATERIAL
1S	U-bolt type A with Polyshrink, 04 Nuts, Washers, 02 Non-gripping Half Round I-rod Thermoplastic Pad, 04 Isolated Bushing	01 set	-A36: for pipe CS -SS316: for pipe SS PTFE Coated (note 2)

PIPE SIZE		T max note 4	U-BOLT (NOTE 3)							NON-GRIPPING I-ROD (NOTE 3)					ISOLATED BUSHING (NOTE 3)				
			d1		A	H	L	H1	MAX. LOAD	B	S	H2	E	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/2"	Ø21.3	10	1/4"	M6	31	80	180	60	220	60	20	10	5	9	8	6.1		12.2	2
3/4"	Ø26.7	10	1/4"	M6	37	84	190	60	220	70	20	10	5	9	8	6.1		12.2	2
1"	Ø33.4	10	3/8"	M10	47	87	200	60	550	76	25	12.5	6	13	12	10.1		24	2
1 1/2"	Ø48.3	10	3/8"	M10	62	102	240	64	550	102	25	12.5	6	13	12	10.1		24	2
2"	Ø60.3	10	3/8"	M10	74	114	270	64	550	114	25	12.5	6	13	12	10.1		24	2
2 1/2"	Ø73.0	16	1/2"	M14	91	133	320	76	1025	128	25	12.5	6	17	16	14.1	5	30	3
3"	Ø88.9	16	1/2"	M14	107	148	355	76	1025	152	25	12.5	6	17	16	14.1	to	30	3
4"	Ø114.3	16	1/2"	M14	132	173	420	76	1025	178	25	12.5	6	17	16	14.1	30	30	3
6"	Ø168.3	16	5/8"	M16	188	241	590	95	1640	230	25	12.5	6	19	18	16.1	(see	34.5	3
8"	Ø219.1	20	5/8"	M16	239	292	720	95	1640	280	25	12.5	6	19	18	16.1	requ.	34.5	3
10"	Ø273.1	20	3/4"	M20	297	351	870	102	2460	344	38	19	10	23	22	20.2	purc.	36	3
12"	Ø323.9	20	7/8"	M24	355	408	1015	108	3420	406	38	19	10	28	27	24.2	&	44	3
14"	Ø355.6	20	7/8"	M24	387	440	1100	108	3420	432	38	19	10	28	27	24.2	note	44	3
16"	Ø406.4	20	7/8"	M24	437	491	1230	108	3420	484	38	19	10	28	27	24.2	3, 4)	44	3
18"	Ø457.0	20	1"	M27	491	551	1380	121	4500	550	38	19	10	31	30	27.5		50	3
20"	Ø508.0	20	1"	M27	542	602	1510	121	4500	600	38	19	10	31	30	27.5		50	3
24"	Ø610.0	20	1"	M27	644	703	1770	121	4500	700	38	19	10	31	30	27.5		50	3
26"	Ø660.0	20	1"	M27	694	754	1900	121	4500	750	38	19	10	31	30	27.5		50	3
28"	Ø711.0	20	1"	M27	745	805	2030	121	4500	800	38	19	10	31	30	27.5		50	3

CONTROLLED

Signed by: Phạm Hồng Quang
Date: 29/10/2021 10:09:05
Certified by: Vietsovpetro CA

NOTES:

1. FOR GENERAL NOTES REFER TO SHEET 2.
2. U-BOLTS AND NUTS SHALL BE PTFE COATED (OR SAME COATED WITH PIPING STUD BOLT OF APPLIED PROJECT).
3. U-BOLT, NON-GRIPPING I-ROD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION, AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR.
4. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.
5. I-ROD ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
6. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.
7. TO BE USED FOR OPERATING TEMPERATURE RANGE OF -30°C TO 100°C.
8. SPECIAL CASE - (FOR PIPE 8" ABOVE): ADD MORE 01 NON-GRIPPING HALF ROUND I-ROD THERMOPLASTIC PAD ON THE SIDE TO INCREASE SUPPORT LOAD, AND ALSO AS A BACKUP LOCATION FOR INSTALLING EXISTING U-BOLT, WHEN ANTI-CORROSION IS NEEDED AT THIS SIDE SUPPORT POSITION.

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.06.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE
FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01 SCALE: -

DRAWING TITLE: PIPE SUPPORT STANDARD
U-BOLT GUIDE - PS06
TYPE A - FOR NORMAL PIPE

SHEET: 10/47

PHASE: DE

FORMAT: A3

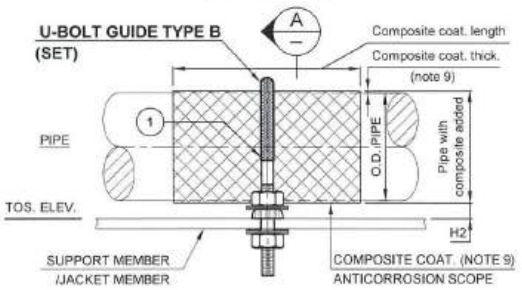
VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

FORMAT: A3

U-BOLT GUIDE FOR PIPE WITH COMPOSITE ADDED (NOTE 9) 2

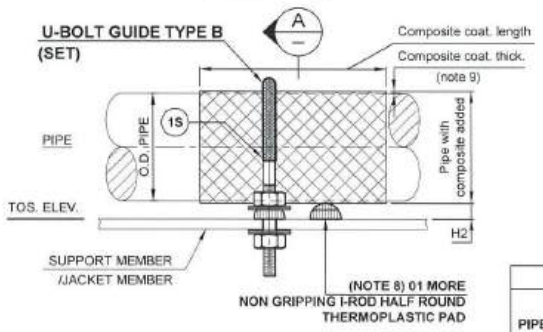
NORMAL CASE

ELEVATION

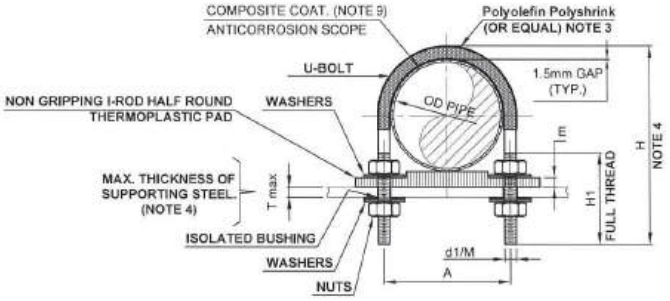


SPECIAL CASE (PIPE 8" ABOVE -Note 8)

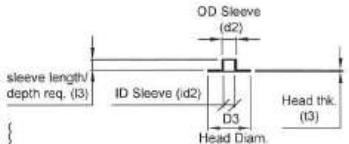
ELEVATION



SECTION A

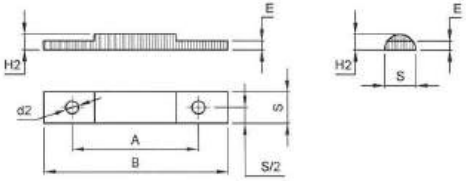


ISOLATED BUSHING



ISOLATED BUSHING (PTFE)
Can be installed from the top
(through i-rod + structural support member,
sleeve length / depth required increases), Vendor Advice

NON-GRIPPING HALF ROUND I-ROD THERMOPLASTIC PAD



SUPPORT MATERIAL- NORMAL CASE			
ITEM	DESCRIPTION	QTY	MATERIAL
1	U-bolt type B with Polyshrink, 04 Nuts, Washers, 01 Non-gripping Half Round I-rod Thermoplastic Pad, 02 Isolated Bushing, for pipe with composite added	01 set	-A36: for pipe CS -SS316: for pipe SS PTFE Coated (note 2)

SUPPORT MATERIAL- SPECIAL CASE (NOTE 8)			
ITEM	DESCRIPTION	QTY	MATERIAL
1S	U-bolt type B with Polyshrink, 04 Nuts, Washers, 02 Non-gripping Half Round I-rod Thermoplastic Pad, 04 Isolated Bushing, for pipe with composite added	01 set	-A36: for pipe CS -SS316: for pipe SS PTFE Coated (note 2)

U-BOLT GUIDE FOR PIPE WITH COMPOSITE ADDED (NOTE 9)

PIPE SIZE		T max note 4	U-BOLT (NOTE 3)							NON-GRIPPING I-ROD (NOTE 3)					ISOLATED BUSHING (NOTE 3)				
			d1		A	H	L	H1	MAX LOAD	B	S	H2	E	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
2"	Ø60.3	10	3/8"	M10	79	119	280	64	550	120	25	12.5	6	13	12	10.1		24	2
2 1/2"	Ø73.0	16	1/2"	M14	96	138	330	76	1025	136	25	12.5	6	17	16	14.1	5	30	3
3"	Ø88.9	16	1/2"	M14	112	153	365	76	1025	158	25	12.5	6	17	16	14.1	to	30	3
4"	Ø114.3	16	1/2"	M14	137	178	430	76	1025	184	25	12.5	6	17	16	14.1	30	30	3
6"	Ø168.3	16	5/8"	M16	193	246	600	95	1640	236	25	12.5	6	19	18	16.1	(see	34.5	3
8"	Ø219.1	20	5/8"	M16	244	297	730	95	1640	290	25	12.5	6	19	18	16.1	requ.	34.5	3
10"	Ø273.1	20	3/4"	M20	302	356	880	102	2460	350	38	19	10	23	22	20.2	purc.	36	3
12"	Ø323.9	20	7/8"	M24	360	413	1025	108	3420	410	38	19	10	28	27	24.2	&	44	3
14"	Ø355.6	20	7/8"	M24	392	445	1110	108	3420	440	38	19	10	28	27	24.2	note	44	3
16"	Ø406.4	20	7/8"	M24	442	496	1240	108	3420	490	38	19	10	28	27	24.2	3, 4)	44	3
18"	Ø457.0	20	1"	M27	496	556	1390	121	4500	550	38	19	10	31	30	27.5		50	3
20"	Ø508.0	20	1"	M27	547	607	1520	121	4500	600	38	19	10	31	30	27.5		50	3
24"	Ø610.0	20	1"	M27	649	708	1780	121	4500	700	38	19	10	31	30	27.5		50	3
26"	Ø660.0	20	1"	M27	699	759	1910	121	4500	750	38	19	10	31	30	27.5		50	3
28"	Ø711.0	20	1"	M27	750	810	2040	121	4500	800	38	19	10	31	30	27.5		50	3

CONTROLLED

Signed by: Pham Hồng Quang
Date: 29/10/2021 10:09:04
Certified by: Vietsovpetro CA

NOTES:

1. FOR GENERAL NOTES REFER TO SHEET 2.
2. U-BOLTS AND NUTS SHALL BE PTFE COATED (OR SAME COATED WITH PIPING STUD BOLT OF APPLIED PROJECT).
3. U-BOLT, NON-GRIPPING I-ROD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION, AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR.
4. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.
5. I-ROD ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
6. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.
7. TO BE USED FOR OPERATING TEMPERATURE RANGE OF -30°C TO 100°C.
8. SPECIAL CASE - (FOR PIPE 8" ABOVE): ADD MORE 01 NON-GRIPPING HALF ROUND I-ROD THERMOPLASTIC PAD ON THE SIDE TO INCREASE SUPPORT LOAD, AND ALSO AS A BACKUP LOCATION FOR INSTALLING EXISTING U-BOLT, WHEN ANTI-CORROSION IS NEEDED AT THIS SIDE SUPPORT POSITION.
9. FOR PROTECTION OF PIPING SYSTEMS (PIPE 2" ABOVE) FROM CORROSION UNDER SUPPORTS, COMPOSITE APPLICATION (TOTAL COATED ~2.5mm THICKNESS) SHOULD BE ADDED WITH LENGTH:
   + PIPE 2" ÷ 6" : LENGTH WILL BE 200mm;
   + PIPE 8" ABOVE : LENGTH WILL BE 300mm;
   + IN SOME SPECIAL CASES (NOT ENOUGH SPACING), THE COMPOSITE LENGTH MAY BE min.100mm.

COMPOSITE COATING SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE 80°C.
THIS COMPOSITE COATING WILL BE SUPPLIED BY ANTI-CORROSION DEPARTMENT (ANTI-CORROSION SCOPE).

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.05.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01 SCALE: -

DRAWING TITLE: PIPE SUPPORT STANDARD U-BOLT GUIDE - PS06 TYPE B - FOR PIPE WITH COMPOSITE ADDED SHEET: 11/47

PHASE: DE

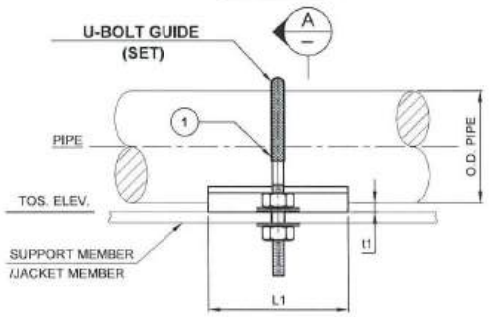
VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

FORMAT: A3

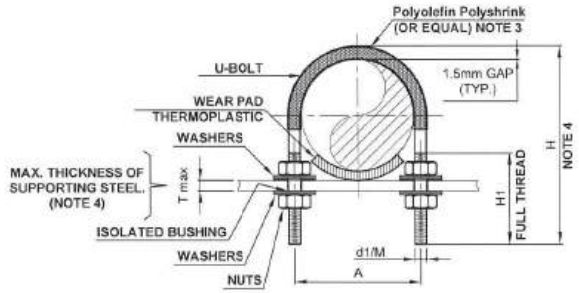
U-BOLT GUIDE WITH WEAR PAD

SUPPORT MATERIAL			
ITEM	DESCRIPTION	QTY	MATERIAL
1	U-bolt with Polyshrink, 04 Nuts, Washers, 01 set Wear Pad Thermal Plastic c/w Adhesives (PS03) and 02 Isolated Bushing	01 set	-A36: for pipe CS -SS316: for pipe SS PTFE Coated (note 5)

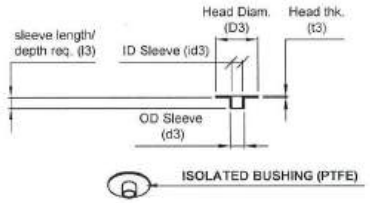
ELEVATION



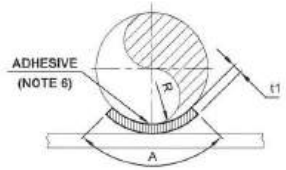
SECTION A



ISOLATED BUSHING



WEAR PAD



PIPE SIZE		T max note 4	U-BOLT (NOTE 3)							WEAR PAD (NOTE 3)				ISOLATED BUSHING (NOTE 3)				
			d1	A	H	L	H1	MAX. LOAD	R	A	t1	L1	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	deg.	mm	mm	mm	mm	mm	mm	mm
1/2"	Ø21.3	10	1/4"	M6	31	80	180	60	220	10.6	90°	6		8	6.1		12.2	2
3/4"	Ø26.7	10	1/4"	M6	37	84	190	60	220	13.3	90°	6		8	6.1		12.2	2
1"	Ø33.4	10	3/8"	M10	47	87	200	60	550	16.7	90°	6		12	10.1		24	2
1 1/2"	Ø48.3	10	3/8"	M10	62	102	240	64	550	24.1	90°	6	100	12	10.1		24	2
2"	Ø60.3	10	3/8"	M10	74	114	270	64	550	30.1	90°	6	Note	12	10.1		24	2
2 1/2"	Ø73.0	16	1/2"	M14	91	133	320	76	1025	36.5	90°	6	3	16	14.1	5	30	3
3"	Ø88.9	16	1/2"	M14	107	148	355	76	1025	44.4	90°	6		16	14.1	to	30	3
4"	Ø114.3	16	1/2"	M14	132	173	420	76	1025	57.1	90°	6		16	14.1	30	30	3
6"	Ø168.3	16	5/8"	M16	188	241	590	95	1640	84.1	60°	6	200	18	16.1	(see	34.5	3
8"	Ø219.1	20	5/8"	M16	239	292	720	95	1640	109.5	60°	6	Note 3	18	16.1	requ.	34.5	3
10"	Ø273.1	20	3/4"	M20	297	351	870	102	2450	136.5	60°	6		22	20.2	purc.	36	3
12"	Ø323.9	20	7/8"	M24	355	408	1015	108	3420	164.9	30°	6		27	24.2	&	44	3
14"	Ø355.6	20	7/8"	M24	387	440	1100	108	3420	177.8	30°	6		27	24.2	note	44	3
16"	Ø406.4	20	7/8"	M24	437	491	1230	108	3420	203.2	30°	6	300	27	24.2	3, 4)	44	3
18"	Ø457.0	20	1"	M27	491	551	1380	121	4500	228.5	30°	6	Note	30	27.5		50	3
20"	Ø508.0	20	1"	M27	542	602	1510	121	4500	254.0	30°	6	3	30	27.5		50	3
24"	Ø610.0	20	1"	M27	644	703	1770	121	4500	305.0	30°	10		30	27.5		50	3
26"	Ø660.0	20	1"	M27	694	754	1900	121	4500	330.0	30°	10		30	27.5		50	3
28"	Ø711.0	20	1"	M27	745	805	2030	121	4500	355.5	30°	10		30	27.5		50	3

Signed by: Pham Hong Quang
Date: 29/10/2021 10:09:06
Certified by: Vietsovpetro CA

NOTES:

1. FOR GENERAL NOTES REFER TO SHEET 2.
2. WEAR PAD TO BE BONDED TO PIPE.
3. U-BOLT, WEAR PAD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION, AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR.
4. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.
5. U-BOLTS AND NUTS SHALL BE PTFE COATED (OR SAME COATED WITH PIPING STUD BOLT OF APPLIED PROJECT).
6. ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR, ADHESIVE IS USED TO FORM A PERIMETER SEAL AROUND WEAR PADS TO ENSURE A SECURE BOND AND SEAL FOR NONE WATER PENETRATION. IF ANY, HEAT SHRINK SLEEVE MAY BE USED TO PROTECT WATERPROOF.
7. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.
8. TO BE USED FOR OPERATING TEMPERATURE RANGE OF -30°C TO 100°C.

CONTROLLED

REV	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.06.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01 | SCALE: -

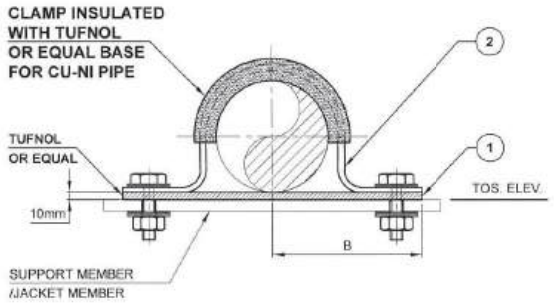
DRAWING TITLE: PIPE SUPPORT STANDARD U-BOLT GUIDE WITH WEAR PAD - PS07 | SHEET: 12/47 | PHASE: DE

VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

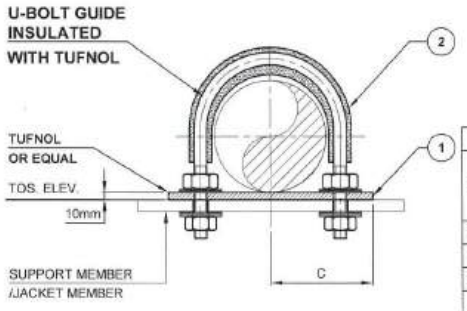
FORMAT: A3

U-BOLT/CLAMP FOR CU-NI PIPES

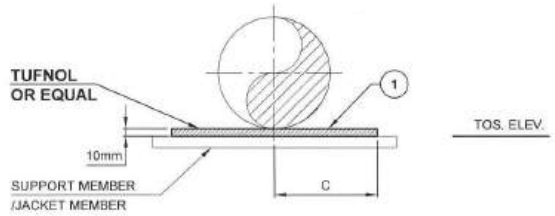
TYPE A - ANCHOR



TYPE B - GUIDE



TYPE C - RESTING



TYPE C - SUPPORT MATERIAL			
ITEM	DESCRIPTION	QTY	MATERIAL
1	Tufnol	01 pc	Tufnol Or Equal

TYPE A - SUPPORT MATERIAL			
ITEM	DESCRIPTION	QTY	MATERIAL
1	Tufnol	01 pc	Tufnol Or Equal
2	Clamp Insulated with Tufnol c/w bolts, nuts, washers, and isolated bushing	01 set	A36 + PTFE Coated (note 2)

TYPE B - SUPPORT MATERIAL			
ITEM	DESCRIPTION	QTY	MATERIAL
1	Tufnol	01 pc	Tufnol Or Equal
2	U-bolt Guide Insulated with Tufnol, c/w 4 nuts, washers and 02 isolated bushing	01 set	A36 + PTFE Coated (note 2)

TUFNOL LENGTH PARAMETER				
NOMINAL PIPE SIZE		OUTSIDE DIA.	B	C
inch	DN	mm	mm	mm
1/2"	15	Ø16	60	30
3/4"	20	Ø25	70	35
1"	25	Ø30	80	38
1 1/2"	40	Ø44.5	85	51
2"	50	Ø57	87	57
2 1/2"	65	Ø76.1	100	64
3"	80	Ø88.9	115	76
4"	100	Ø108	131	89
6"	150	Ø159	172	115
8"	200	Ø219.1	212	140
10"	250	Ø267	220	172
12"	300	Ø323.9	245	203

U-BOLT GUIDE TYPE A FOR CU-NI PIPE (NORMAL)

PIPE SIZE		T max note 4	U-BOLT (NOTE 3)							TUFNOL (NOTE 3)		ISOLATED BUSHING (NOTE 3)				
			d1		A	H	L	H1	MAX. LOAD	c	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm
1/2"	Ø16	10	1/4"	M6	26	75	165	60	220	30	9	8	6.1		12.2	2
3/4"	Ø25	10	1/4"	M6	35	80	180	60	220	35	9	8	6.1	5	12.2	2
1"	Ø30	10	3/8"	M10	44	84	200	60	550	38	13	12	10.1	to	24	2
1 1/2"	Ø44.5	10	3/8"	M10	59	102	240	64	550	51	13	12	10.1	30	24	2
2"	Ø57	10	3/8"	M10	71	114	270	64	550	57	13	12	10.1	(see	24	2
2 1/2"	Ø76.1	16	1/2"	M14	95	130	320	76	1025	64	17	16	14.1	requ.	30	3
3"	Ø88.9	16	1/2"	M14	107	150	360	76	1025	76	17	16	14.1	purc.	30	3
4"	Ø108	16	1/2"	M14	126	175	420	76	1025	89	17	16	14.1	&	30	3
6"	Ø159	16	5/8"	M16	180	245	590	95	1640	115	19	18	16.1	note	34.5	3
8"	Ø219.1	20	5/8"	M16	240	292	720	95	1640	140	19	18	16.1	3, 4)	34.5	3
10"	Ø267	20	3/4"	M20	292	351	870	102	2460	172	23	22	20.2		36	3
12"	Ø323.9	20	7/8"	M24	353	408	1015	108	3420	203	28	27	24.2		44	3

U-BOLT GUIDE TYPE B FOR CU-NI PIPE WITH COMPOSITE ADDED (NOTE 7)

PIPE SIZE		T max note 4	U-BOLT (NOTE 3)							TUFNOL (NOTE 3)		ISOLATED BUSHING (NOTE 3)				
			d1		A	H	L	H1	MAX. LOAD	c	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm
2"	Ø57	10	3/8"	M10	76	119	280	64	550	60	13	12	10.1	5 to	24	2
2 1/2"	Ø76.1	16	1/2"	M14	100	135	330	76	1025	67	17	16	14.1	30	30	3
3"	Ø88.9	16	1/2"	M14	112	155	370	76	1025	79	17	16	14.1	(see	30	3
4"	Ø108	16	1/2"	M14	131	180	430	76	1025	92	17	16	14.1	requ.	30	3
6"	Ø159	16	5/8"	M16	185	250	600	95	1640	118	19	18	16.1	purc.	34.5	3
8"	Ø219.1	20	5/8"	M16	245	297	730	95	1640	142	19	18	16.1	&	34.5	3
10"	Ø267	20	3/4"	M20	297	356	880	102	2460	175	23	22	20.2	note	36	3
12"	Ø323.9	20	7/8"	M24	368	413	1025	108	3420	205	28	27	24.2	3, 4)	44	3

Signed by: Pham Hồng Quang
Date: 29/10/2021 10:09:02
Certified by: Vietsovpetro CA

CONTROLLED

NOTES:
1. FOR GENERAL NOTES REFER TO SHEET 2.
2. U-BOLT TO BE SUPPLIED WITH HEX NUTS AND WASHERS SHALL BE PTFE COATED (OR SAME COATED WITH PIPING STUD BOLT OF APPLIED PROJECT).
3. ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
4. FOR PIPE REST USE 10mm THICKNESS TUFNOL OR EQUAL.
5. CLAMP DIMENSION SHALL BE DESIGNED / CONFIRMED BY VENDOR.
6. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.

7. FOR PROTECTION OF PIPING SYSTEMS (PIPE 2" ABOVE) FROM CORROSION UNDER SUPPORTS, COMPOSITE APPLICATION (TOTAL COATED ~2.5mm THICKNESS) SHOULD BE ADDED WITH LENGTH:
+ PIPE 2" ÷ 6" : LENGTH WILL BE 200mm;
+ PIPE 8" ABOVE : LENGTH WILL BE 300mm;
+ IN SOME SPECIAL CASES (NOT ENOUGH SPACING), THE COMPOSITE LENGTH MAY BE min.100mm.
COMPOSITE COATING SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE 80°C.
THIS COMPOSITE COATING WILL BE SUPPLIED BY ANTI-CORROSION DEPARTMENT (ANTI-CORROSION SCOPE).

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.06.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01 | SCALE: -

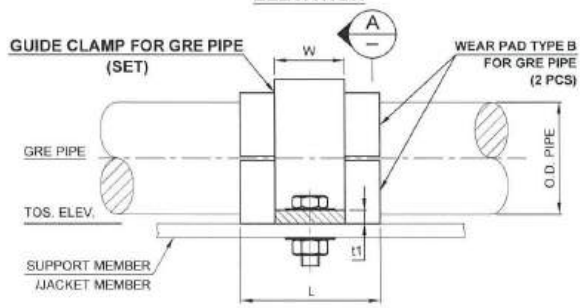
DRAWING TITLE: PIPE SUPPORT STANDARD U-BOLT/CLAMP FOR CU-NI PIPES - PS08 | SHEET: 13/47 | PHASE: DE

VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

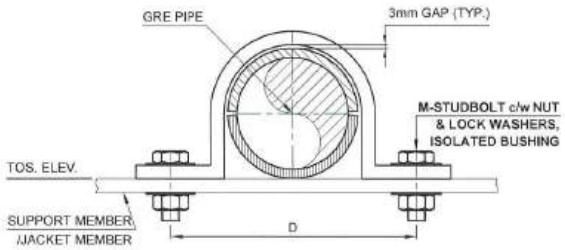
GUIDE CLAMP FOR GRE PIPE

SUPPORT MATERIAL			
ITEM	DESCRIPTION	QTY	MATERIAL
1	Guide Clamp includes 02 set Stud bolts, Nuts, Washers, 02 isolated bushing and 02 GRE Wear Pad c/w Adhesives (PS03 TYPE B)	01 set	ASTM A36 Or Equal

ELEVATION

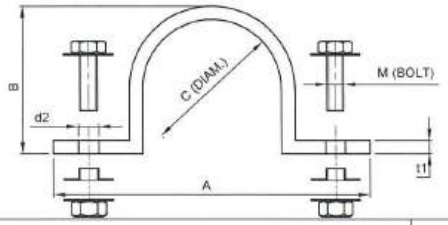


SECTION A

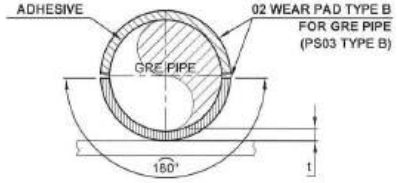


PIPE SIZE		GUIDE CLAMP (NOTE 3)										GRE WEAR PAD	
		FLAT SIDE (MADE FROM PLATE)								BOLT&NUT			
		A	B	C	D	d2	t1	W	Length	M	Length	t	L
inch	DN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1"	25	180	71	51	131	12	6	50	330	M10	50	14	100 OR 150 NOTE 3
1 1/2"	40	200	84	64	144	12	6	50	380	M10	50	14	
2"	50	220	100	77	157	12	6	50	430	M10	60	14	
3"	80	260	129	102	186	16	6	50	530	M14	75	14	
4"	100	290	154	128	211	16	6	50	620	M14	75	14	
6"	150	370	212	178	277	18	10	50	820	M16	90	14	
8"	200	420	265	232	330	18	10	50	990	M16	90	14	
10"	250	500	322	287	387	23	10	65	1190	M20	100	14	
12"	300	550	375	341	440	23	10	65	1350	M20	100	14	
14"	350	560	442	408	521	27	10	65	1600	M24	120	14	
16"	400	710	497	463	576	27	10	65	1770	M24	120	14	
18"	450	780	551	517	630	30	10	80	1960	M27	130	16	
20"	500	830	606	572	685	30	10	80	2130	M27	130	16	
24"	600	940	715	681	794	30	10	80	2470	M27	130	16	

GUIDE CLAMP



02 GRE WEAR PAD



CONTROLLED

Signed by: Pham Hồng Quang
Date: 29/10/2021 10:09:06
Certified by: Vietsovpetro CA

NOTES:
1. FOR GENERAL NOTES REFER TO SHEET 2.
2. GUIDE CLAMP WILL BE MADE FROM PLATE A36, PAINTED ACCORDING TO SPECIFICATION.
3. GRE WEAR PAD DIMENSION ARE FOR REFERENCE. DIMENSION SHALL BE CONFIRMED BY VENDOR.
4. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "LENGTH OF BOLT" SHALL BE INCREASED ACCORDINGLY.
5. BOLTS AND NUTS SHALL BE PTFE COATED (OR SAME COATED WITH PIPING STUD BOLT OF APPLIED PROJECT).
6. ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR. ADHESIVE IS USED TO FORM A PERIMETER SEAL AROUND WEAR PADS TO ENSURE A SECURE BOND AND SEAL FOR NONE WATER PENETRATION.
7. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.

REV.	DATE	DES.	PREPARED
2	27.10.21	IFA	P.H.QUANG
1	02.05.21	IFA	P.H.QUANG
0	10.01.20	IFA	P.H.QUANG

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT: TYPICAL ENGINEERING DOCUMENTATION

DRAWING NO.: VSP-NIPI-TYP-TS-PI1-GEN-01 | SCALE: -

DRAWING TITLE: PIPE SUPPORT STANDARD GUIDE CLAMP FOR GRE PIPE - PS09 | SHEET: 14/47 | PHASE: DE

FORMAT: A3

VSP-NIPI-TYP-TS-PI1-GEN-01_2_Pipe Support Standard.dwg

BALL VALVE DATASHEET: BACA6L							
SERVICE DETAILS				**ESTIMATED WEIGHT**			
1	Valve code:	BACA26L		35	Shipping:	VTA	kg
2	Size Range:	1/2" to 1 1/2"		36	Operating:	VTA	kg
3	Qty:	-		**MATCHING PIPE AND FLANGE**			
4	Rating:	3000 psig/ANSI 800#		37	Size Range:	1/2" to 1 1/2"	
5	End Connection:	SWxNPTF,ASME B16.11xASME B1.20.1		38	Wall thickness:	As per Piping Class AC01/AC02/BC01/DC01 (Note 6)	
6	Valve type:	Ball		39	Pipe Material:		
7	Construction -body:	Split body, replaceable ball		40	Pipe class / Spec:	150# /300#/600# AC01/ AC02/BC01/DC01	
8	Construction -ball:	Floating		41	Flange Material:	N/A	
9	Design Life	25 years		42	Flange Rating:	N/A	
10	Design:	BS EN ISO 17292/ ASME B16.34		**MATERIALS**			
11	Face to face dimensions:	ASME B16.10 Long pattern		43	Body material	ASTM A105N or Equal	
12	Fire Safe:	API 607/API6FA/BS6755		44	Ball:	ASTM A182-F316 or Equal	
13	Piping Design Code:	ASME B31.3		45	Stem:	ASTM A182-F316 or Equal	
14	Corrosion Allowance (mm):	3 (AC01); 1.5 (AC02); 3 (BC01); 3(DC01)		46	Seat ring:	VTA	
15	Stem Extension	N/A		47	Seat inserts:	RPTFE (Note 3)	
PROCESS CONDITIONS				48	Trunnion:	N/A	
16	Pressure - inlet	3.5 to 75barg		49	Springs:	Inconel X750	
17	Pressure drop:	-		50	O-ring seals:	Viton or PTFE (Note 3)	
18	Des. Temp, -min.max:	-15deg C	100 deg C	51	Seal Packing material:	Suitable for service condition	
19	Op Temp. -min/max:	-	-	52	Bolts & nuts:	A193-B7/ A194-2H (Note 4)	
20	Fluid type:	Process Liquid, Fuel Gas, Closed Drain, Nitrogen...		53	Fire safe seals:	Compressed Carbon Fibre/Graphoil	
21	Fluid state:	Vapour & Liquid		54	Extended welded end pup pieces	ASTM A106 Gr B Sch160 / Sch80 (Note 8)	
22	Sour Service:	No		**EXTERNAL PROTECTION**			
GENERAL				55	Painting:	BK.TNG-001-GEN-AZ-SP-02	
23	Manufacturer:	VTA		56	To suit environment:	Saliferous tropical marine environment	
24	Model Number:	VTA		57	To suit insulation over:	N/A	
25	Reduced or full bore:	Full Bore		**TEST REQUIREMENTS**			
26	Anti-static device:	N/A		58	Hydrostatic test:	Note 5	
27	Blow-out Proof Stem:	N/A		59	Leak test:	Note 5	
28	Body Cavity Pressure Relief:	N/A		60	Radiography:	Note 5	
29	Sealant Injection:	N/A		61	Inspection:	Yes, Factory Inspection Acceptance	
30	Renewable Seats:	Yes		62	Material certification:	Required Inc. Type 3.1	
31	Operator:	Lever with position indicator		63	Visual Examination:	Note 5	
32	Action:	Quarter turn		64	Magnetic Particle Inspection:	Note 5	
33	Lockable:	Yes		65	Liquid Penetrant Inspection:	Note 5	
34	Lifting Lugs	N/A		66			

Notes:1.VTA denotes Vendor to advice, indicates information to be completed and supplied with Vendor's quotation.
2.Valve seat pressure/ temperature shall equal or exceed the body rating.
3.RPTFE–(Reinforced) PolyTetraFluoroEthylene. Manufacturer shall select seat material to meet design pressure/temperature range
4.Studs to be coated with Xylan Fluorocarbon coated.
5.Test pressure shall be in accordance with ASME B16.34 and valve inspection and testing procedure shall be in accordance with API 598/ API 6D.
6.This document shall be read in accordance with document "Specification for Manual Valves" BK.TNG-001-TS-PI-SP-002. And "Piping Material Specification" BK.TNG-001-TS-PI-SP-001
7.Vendor is to verify that nominated materials are suitable for service conditions.
8. Pup pieces of 100 mm shall be provided on the SW ends of valves.

BALL VALVE DATASHEET: BABD4G							
SERVICE DETAILS				**ESTIMATED WEIGHT**			
1	Valve code:	BABD4G		35	Shipping:	VTA	kg
2	Size Range:	6" to 24"		36	Operating:	VTA	kg
3	Qty:	-		**MATCHING PIPE AND FLANGE**			
4	Rating:	ASME Class 300		37	Size Range:	6" to 24"	
5	End Connection:	Raise Face, ASME B16.5		38	Wall thickness:	As per Piping Class BC01 (Note 6)	
6	Valve type:	Ball		39	Pipe Material:		
7	Construction –body:	Split body, replaceable ball		40	Pipe class / Spec:	300# / BC01	
8	Construction –ball:	Trunnion mounted		41	Flange Material:	ASTM A105N	
9	Design Life	25 years		42	Flange Rating:	300# RF ASME B16.5	
10	Design:	ASME B16.34/API 6D		**MATERIALS**			
11	Face to face dimensions:	ASME B16.10 Long pattern		43	Body material	ASTM A216-WCB or Equal	
12	Fire Safe:	API 607/API 6FA/BS 6755		44	Ball:	ASTM A182-F316 or Equal	
13	Piping Design Code:	ASME B31.3		45	Stem:	ASTM A182-F316 or Equal	
14	Corrosion Allowance (mm):	3		46	Seat ring:	VTA	
15	Stem Extension	Yes, if required in RQ		47	Seat inserts:	RPTFE (Note 3)	
PROCESS CONDITIONS				48	Trunnion:	ASTM A182-F316/ASTM A105+ENP (Note 8)	
16	Pressure – inlet, max.	25 to 42.2 barg		49	Springs:	Inconel X750	
17	Pressure drop:	-		50	O-ring seals:	Viton or RPTFE (Note 3)	
18	Des. Temp, -min.max:	-5 deg C	100 deg C	51	Stem Packing:	Suitable for service condition	
19	Op Temp. –min/max:	-	-	52	Bolts & nuts:	A193-B7/ A194-2H (Note 4)	
20	Fluid type:	Process Liquid, Fuel Gas, Closed Drain, Nitrogen...		53	Fire safe seals:	Graphite	
21	Fluid state:	Vapour & Liquid		54	Extended welded end pup pieces	N/A	
22	Sour Service:	No		**EXTERNAL PROTECTION**			
GENERAL				55	Painting:	BK.TNG-001-GEN-AZ-SP-02	
23	Manufacturer:	VTA		56	To suit environment:	Saliferous tropical marine environment	
24	Model Number:	VTA		57	To suit insulation over:	N/A	
25	Reduced or full bore:	Reduced Bore		**TEST REQUIREMENTS**			
26	Anti-static device:	Yes		58	Hydrostatic test:	Note 5	
27	Blow-out Proof Stem:	Yes		59	Leak test:	Note 5	
28	Body Cavity Pressure Relief:	Yes		60	Radiography:	Note 5,6	
29	Sealant Injection:	Yes		61	Inspection:	Yes, Factory Inspection Acceptance	
30	Renewable Seats:	Yes		62	Material certification:	Required Inc. Type 3.1	
31	Operator:	Gear with position indicator		63	Visual Examination:	Note 5	
32	Action:	Quarter turn		64	Magnetic Particle Inspection:	Note 5	
33	Lockable:	Yes, if required in RQ		65	Liquid Penetrant Inspection:	Note 5	
34	Lifting Lugs	Note 6		66			

NOTES:1.VTA denotes Vendor to advice, indicates information to be completed and supplied with Vendor's quotation.
2.Valve seat pressure/ temperature shall equal or exceed the body rating.
3.RPTFE – (Reinforced) Poly Tetra Fluoro Ethylene. Manufacturer shall select seat material to meet the design pressure/temperature range
4.Studs to be coated with Xylan Fluorocarbon coated.
5.Test pressure shall be in accordance with ASME B16.34 and valve inspection and testing procedure shall be in accordance with API 598/ API 6D.
6.This document shall be read in accordance with document "Specification for Manual Valves" BK.TNG-001-TS-PI-SP-002 and "Piping Material Specification" BK.TNG-001-TS-PI-SP-001
7.Vendor is to verify that nominated materials are suitable for service condition.
8.ENP-Electroless Nickel Plating.

MONOFLANGE VALVE DATASHEET: MVBAAT							
SERVICE DETAILS				**ESTIMATED WEIGHT**			
1	Valve code:	MVBAAT		32	Shipping:	VTA	kg
2	Input Size Range:	1/2" to 3"		33	Operating:	VTA	kg
3	Qty:	-		**MATCHING PIPE AND FLANGE**			
4	Rating:	ASME Class 300		34	Size Range:	1/2" to 3"	
5	End Connection - Input:	Raise Face, ASME B16.5		35	Wall thickness:	As per Piping Class BC01/ BS01 /BX01(Note 4)	
6	End Connection – Output & Bleed	½" NPTF, ASME B1.20.1		36	Pipe Material:		
7	Valve type:	Monoflange valve, one piece forged Flange.		37	Flange Material		
8	Construction -body:	Single Block and Bleed		38	Pipe class / Spec:	300# / BC01/ BS01	
9	Isolate valve:	Needle Type, OS&Y, BB		39	Flange Rating:	300# RF, ASME B16.5	
10	Bleed valve:	Needle Type, Screwed Bonnet		**MATERIALS (Note 6)**			
11	Design Life	25 years		40	Body & Bonnet Material:	ASTM A182F316/316L or Equal	
12	Design:	ASME B16.34 &BS EN ISO17292/15761		41	Needle valve:	ASTM A182F316/316L or Equal	
13	Face to face dimensions:	Manufacture's Standard		42	Stem:	ASTM A182F316/316L or Equal	
14	Fire Safe:	API 607 or API 6FA		43	Hex. Plug:	ASTM A182F316/316L or Equal	
15	Piping Design Code:	ASME B31.3		44	Stem Packing:	Graphite or PTFE	
16	Corrosion Allowance (mm):	3 (BC01),(BX01); 0 (BS01)		45	Bonnet Gasket:	Spiral wound 316SS Graphite filled	
PROCESS CONDITIONS				46	Back seat	VTA	
17	Pressure - inlet, max.	42.2 barg		47	Bolts & nuts:	A193-B8/ A194-8 (Note 5)	
18	Pressure drop:	-		48	Fire safe seals:	N/A	
19	Des. Temp, -min.max:	-5 deg C	100 deg C	49	Pipe pups	N/A	
20	Op Temp. -min/max:	-	-	**EXTERNAL PROTECTION**			
21	Fluid type:	Process Gas, Fuel Gas, Closed Drain, Nitrogen...		50	Painting:	BK.TNG-001-TS-AZ-RPT-02	
22	Fluid state:	Vapour & Liquid		51	To suit environment:	Saliferous tropical marine environment	
23	Sour Service:	No		52	To suit insulation over:	N/A	
GENERAL				**TEST REQUIREMENTS**			
24	Manufacturer:	VTA		53	Hydrostatic test:	Yes, (Note 3)	
25	Model Number:	VTA		54	Leak test:	Yes, (Note 3)	
26	Renewable Seats:	Yes		55	Radiography:	Yes, (Note 3, 4)	
27	Operator:	T-Bar or antitamper handle		56	Inspection:	Yes, Factory Inspection Acceptance	
28	Action:	Rising Stem		57	Material certification:	Required Inc. Type 3.1	
29	Lockable:	N/A		58	Visual Examination:	Required	
30	Lifting Lugs	N/A		59	Magnetic Particle Inspection:	N/A	
				60	Liquid Penetrant Inspection:	Yes, (Note 3,4)	

Notes:

1. VTA denotes Vendor to advice, indicates information to be completed and supplied with Vendor's quotation.
2. Valve seat pressure/ temperature shall equal or exceed the body rating.
3. Test pressure shall be in accordance with ASME B16.34 and valve inspection and testing procedure shall be in accordance with API 598/ API 6D/ BS 6755/ API 607.
4. This document shall be read in accordance with document "Specification for Manual Valves" BK.TNG-001-TS-PI-SP-002. And "Piping Material Specification" BK.TNG-001-TS-PI-SP-001
5. Studs to be coated with XylanFluorocarbon coated.
6. Vendor is to verify that nominated materials are suitable for the proposed service.
7. Manufacturer shall select seat material to meet pressure/temperature range.

RESEARCH AND ENGINEERING INSTITUTE
FOR OFFSHORE OIL AND GAS

TYPICAL ENGINEERING DOCUMENTATION

DOCUMENT TITLE : DATASHEET FOR U-BOLT SUPPORT

DOCUMENT NO. : VSP-NIPI-TYP-TS-PI1-DS-100

Signed by: Phạm Hồng Quang
Date: 29/10/2021 10:09:24
Certified by: Vietsovpetro CA

Signed by: Lương Thuý Dương
Date: 29/10/2021 10:12:49
Certified by: Vietsovpetro CA

Signed by: Nguyễn Tấn Hải
Date: 29/10/2021 11:29:24
Certified by: Vietsovpetro CA

Signed by: Trần Duy Hải
Date: 29/10/2021 15:16:10
Certified by: Vietsovpetro CA

Signed by: Bùi Trọng Hân
Date: 31/10/2021 11:21:21
Certified by: Vietsovpetro CA

CONTROLLED

REV.	DES.	DATE	PREPARED	CHECKED	DEPART. MANAGER	ENG. MANAGER	PRO. MANAGER
1	IFA	27/10/2021	P.H.QUANG	L.T.DUONG	N.T.HAI	T.D.HAI	B.T.HAN
0	IFA	02/06/2021	P.H.QUANG	L.T.DUONG	N.T.HAI	T.D.HAI	B.T.HAN

Change Log

REV	SECTION	PAGE	CHANGE DESCRIPTION
1		all	Update dimension U-Bolt, name (add type A/B)
			Add case U- bolt for pipe with coposite added (~2.5mm thick.) by anti-corrosion department.

Reference Documents

VSP-NIPI-TYP-TS-PI1-GEN-01	Pipe Support Standard
VSP-NIPI-TYP-TS-PI1-SP-06	Specification for Pipe Support
VSP-NIPI-TYP-GE-AC7-SP-01	Painting specification for platform
VSP-NIPI-TYP-GE-AC7-SCH-01	Basic painting schedules for platform
	Purchase Requisition for support (Project applied)

TABLE OF CONTENTS

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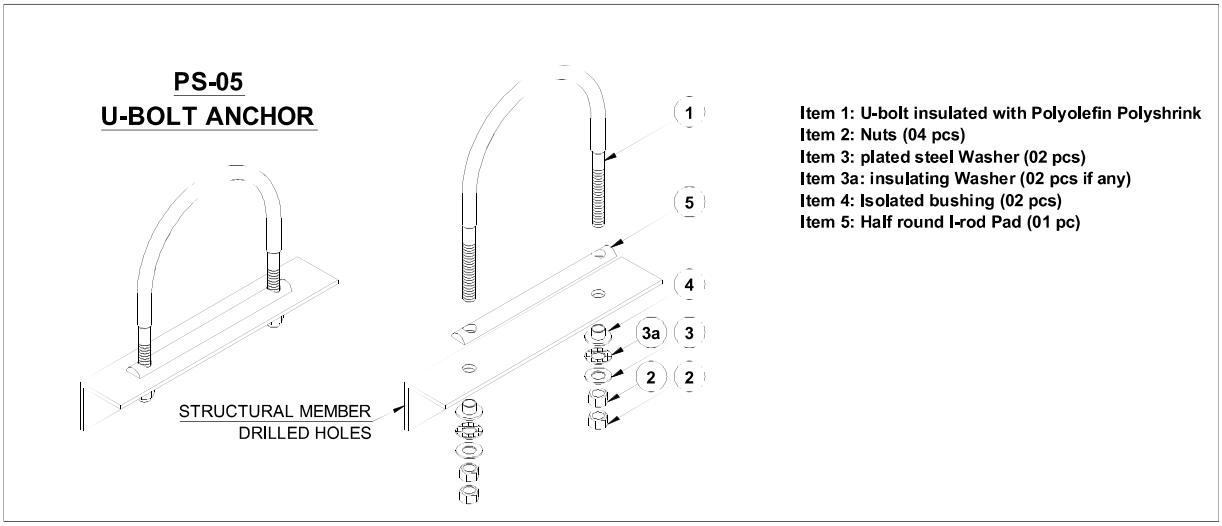
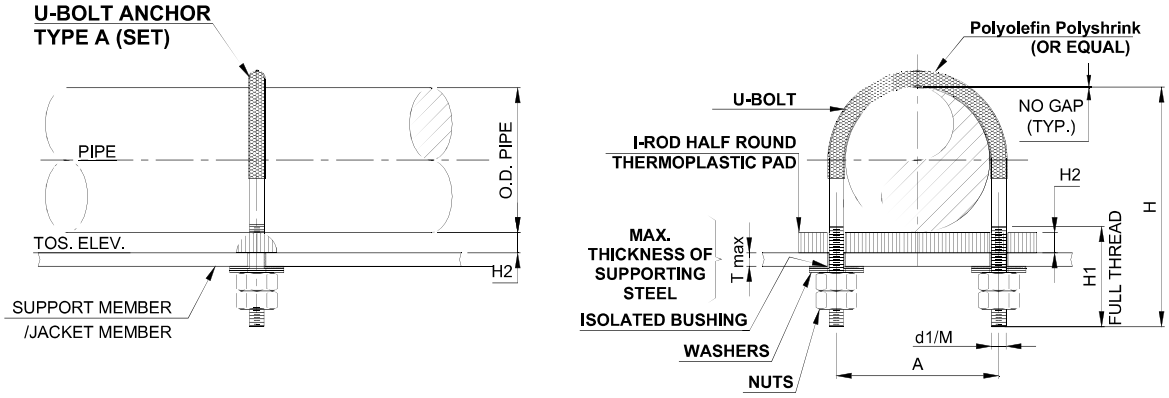
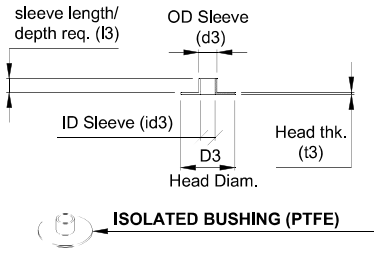
DATASHEET U-BOLT GUIDE (PS-06) 7
DATASHEET U-BOLT GUIDE WITH WEAR PAD (PS-07) 10
DATASHEET U-BOLT GUIDE FOR CU-NI PIPE (PS-08) 12
ADHESIVE INFORMATION 14

DATASHEET U-BOLT ANCHOR (PS-05)		
GENERAL		
1	Type	U-bolt Anchor – PS05 (refer VSP-NIPI-TYP-TS-PI1-GEN-01): - **U-bolt Anchor (PS05) type A**: for normal pipe (only painting). - **U-bolt Anchor (PS05) type B**: for pipe with composite added (total coat. ~2.5mm thickness by anti-corrosion department). Type as per Purchase requisition document (Project applied).
2	Support Pipe Size	as per Purchase requisition document (Project applied)
3	Quantity	as per Purchase requisition document (Project applied)
U-BOLT SUPPORT DESCRIPTION		
4		
5	Item 1	U-bolt (01 pc): PTFE coated / hot-dip galvanized or equal (as per Purchase requisition), insulated with Polyolefin Polyshrink to nuts, dimensions are based on "Nu-Bolt" Engineering. U-bolt: -ASTM A36 for support pipe Carbon Steel -SS316 for support pipe Stainless Steel (as per Purchase requisition)
6	Item 2	U-bolt Nut (04 pcs): PTFE coated/ hot-dip galvanized or equal (as per Purchase requisition), Nuts: -ASTM A36 for support pipe Carbon Steel -SS316 for support pipe Stainless Steel (as per Purchase requisition)
7	Item 3	3mm thk. Plated steel Washer (02 pcs), PTFE coated / hot-dip galvanized (as per Purchase requisition)
8	Item 3a	3mm thk. insulating washer (02 pcs if any - as per Purchase requisition), PTFE or Glass reinforced epoxy resin G10
9	Item 4	Isolated bushing (02 pcs), PTFE or Glass reinforced epoxy resin G10 Vendor to Advice
10	Item 5	Half round I-rod Pad (01 pc or 02pcs as per Purchase requisition in special case) Teflon pad (White) Maximum Operating Temperature 83°C. Weight Load on the I-rod at each Pipe Support : as per Purchase requisition
11	Dimension (mm)	See Drawing typical page 5,6, VTA - note 2,3
12	Weight	VTA
REQUIREMENT		
13	Certificate	Certificate of conformance
14	Marking	as per MSS-SP-25
NOTES		
* VTA * Denotes Vendor to advise 1. Refer to Pipe Support Standard _ VSP-NIPI-TYP-TS-PI1-GEN-01. 2. Drawing PS-05 U-bolt Anchor: type A on page 5 & type B on page 6 are for reference, Vendor to advise. 3. Vendor shall furnish detail cross section with dimensions and specify suitable materials, shall be completed with quotation. 4. Refer page 14 for Half round I-rod Pad's Adhesive information, Vendor to advise.		

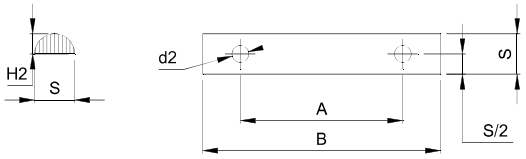
U-BOLT ANCHOR (PS-05) - TYPE A
FOR NORMAL PIPE



ISOLATED BUSHING



HALF ROUND I-ROD THERMOPLASTIC PAD

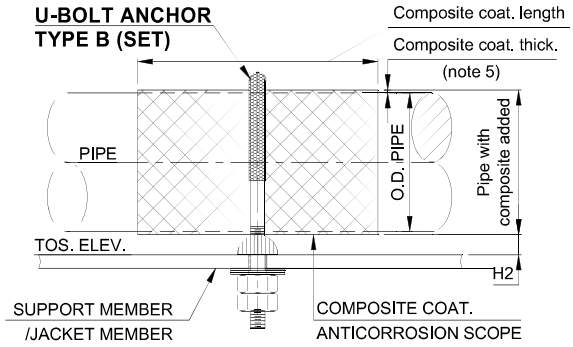


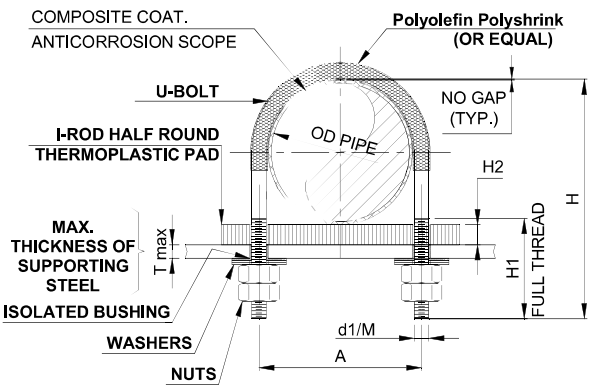
PIPE SIZE		T max note 2	U-BOLT (NOTE 1)							I-ROD (NOTE 1)				ISOLATED BUSHING (NOTE 1)				
			d1		A	H	L	H1	MAX. LOAD	B	S	H2	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/2"	Ø21.3	10	1/4"	M6	28	80	190	60	220	60	20	10	9	8	6.1		12.2	2
3/4"	Ø26.7	10	1/4"	M6	34	84	200	60	220	70	20	10	9	8	6.1		12.2	2
1"	Ø33.4	10	3/8"	M10	44	87	220	60	550	76	25	12.5	13	12	10.1		24	2
1 1/2"	Ø48.3	10	3/8"	M10	59	102	260	64	550	102	25	12.5	13	12	10.1		24	2
2"	Ø60.3	10	3/8"	M10	71	114	285	64	550	114	25	12.5	13	12	10.1		24	2
2 1/2"	Ø73.0	16	1/2"	M14	88	133	340	76	1025	128	25	12.5	17	16	14.1	5	30	3
3"	Ø88.9	16	1/2"	M14	104	148	380	76	1025	150	25	12.5	17	16	14.1	to	30	3
4"	Ø114.3	16	1/2"	M14	129	173	445	76	1025	178	25	12.5	17	16	14.1	30	30	3
6"	Ø168.3	16	5/8"	M16	185	241	625	95	1640	230	25	12.5	19	18	16.1	(see	34.5	3
8"	Ø219.1	20	5/8"	M16	236	292	750	95	1640	280	25	12.5	19	18	16.1	requ.	34.5	3
10"	Ø273.1	20	3/4"	M20	294	351	910	102	2460	344	38	19	23	22	20.2	purc.	36	3
12"	Ø323.9	20	7/8"	M24	349	408	1060	108	3420	406	38	19	28	27	24.2	&	44	3
14"	Ø355.6	20	7/8"	M24	381	440	1140	108	3420	432	38	19	28	27	24.2	note	44	3
16"	Ø406.4	20	7/8"	M24	431	491	1270	108	3420	484	38	19	28	27	24.2	1, 2)	44	3
18"	Ø457.0	20	1"	M27	485	551	1430	121	4500	550	38	19	31	30	27.5		50	3
20"	Ø508.0	20	1"	M27	536	602	1560	121	4500	600	38	19	31	30	27.5		50	3
24"	Ø610.0	20	1"	M27	638	703	1820	121	4500	700	38	19	31	30	27.5		50	3
26"	Ø660.0	20	1"	M27	688	754	1950	121	4500	750	38	19	31	30	27.5		50	3
28"	Ø711.0	20	1"	M27	739	805	2080	121	4500	800	38	19	31	30	27.5		50	3

NOTES:

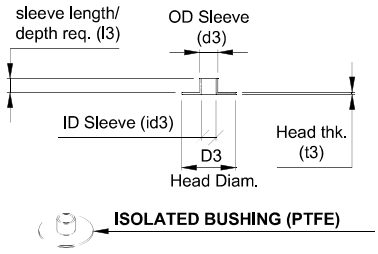
1. U-BOLT, I-ROD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION, AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR.
2. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.
3. I-ROD ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
4. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.

U-BOLT ANCHOR (PS-05) - TYPE B
FOR PIPE WITH COMPOSITE ADDED (NOTE 5)

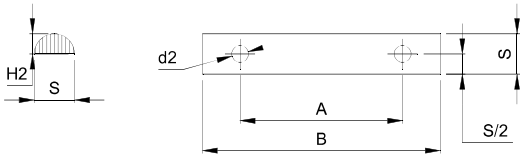




ISOLATED BUSHING



HALF ROUND I-ROD THERMOPLASTIC PAD

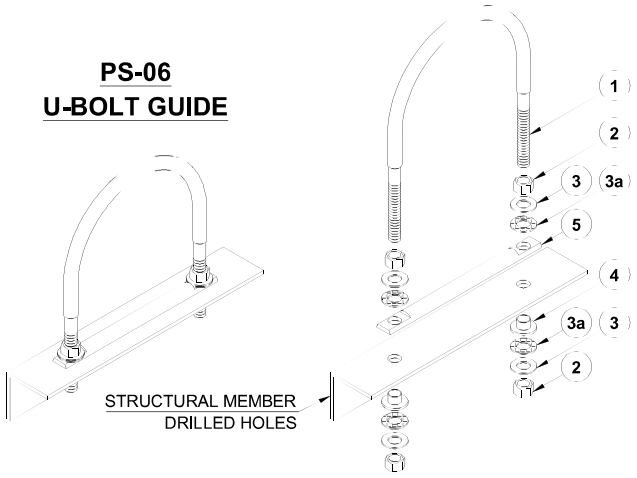


PIPE SIZE		T max note 2	U-BOLT (NOTE 1)							I-ROD (NOTE 1)				ISOLATED BUSHING (NOTE 1)				
			d1		A	H	L	H1	MAX. LOAD	B	S	H2	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm
2"	Ø60.3	10	3/8"	M10	76	119	295	64	550	120	25	12.5	13	12	10.1		24	2
2 1/2"	Ø73.0	16	1/2"	M14	93	138	350	76	1025	134	25	12.5	17	16	14.1	5	30	3
3"	Ø88.9	16	1/2"	M14	109	153	390	76	1025	156	25	12.5	17	16	14.1	to	30	3
4"	Ø114.3	16	1/2"	M14	134	178	455	76	1025	180	25	12.5	17	16	14.1	30	30	3
6"	Ø168.3	16	5/8"	M16	190	246	635	95	1640	235	25	12.5	19	18	16.1	(see	34.5	3
8"	Ø219.1	20	5/8"	M16	241	297	760	95	1640	285	25	12.5	19	18	16.1	requ.	34.5	3
10"	Ø273.1	20	3/4"	M20	299	356	920	102	2460	350	38	19	23	22	20.2	purc.	36	3
12"	Ø323.9	20	7/8"	M24	354	413	1070	108	3420	410	38	19	28	27	24.2	&	44	3
14"	Ø355.6	20	7/8"	M24	386	445	1150	108	3420	436	38	19	28	27	24.2	note	44	3
16"	Ø406.4	20	7/8"	M24	436	496	1280	108	3420	490	38	19	28	27	24.2	1, 2)	44	3
18"	Ø457.0	20	1"	M27	490	556	1440	121	4500	550	38	19	31	30	27.5		50	3
20"	Ø508.0	20	1"	M27	541	607	1570	121	4500	600	38	19	31	30	27.5		50	3
24"	Ø610.0	20	1"	M27	643	708	1830	121	4500	700	38	19	31	30	27.5		50	3
26"	Ø660.0	20	1"	M27	693	759	1960	121	4500	750	38	19	31	30	27.5		50	3
28"	Ø711.0	20	1"	M27	744	810	2090	121	4500	800	38	19	31	30	27.5		50	3

NOTES:

1. U-BOLT, I-ROD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION, AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR.
2. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.
3. I-ROD ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
4. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.
5. FOR PROTECTION OF PIPING SYSTEMS (PIPE 2" ABOVE) FROM CORROSION UNDER SUPPORTS, COMPOSITE APPLICATION (TOTAL COATED ~2.5mm THICKNESS) SHOULD BE ADDED WITH LENGTH:
   - + PIPE 2" ÷ 6" : LENGTH WILL BE 200mm;
   - + PIPE 8" ABOVE : LENGTH WILL BE 300mm;
   - + IN SOME SPECIAL CASES (NOT ENOUGH SPACING), THE COMPOSITE LENGTH MAY BE min.100mm.

   COMPOSITE COATING SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE 80°C.
   THIS COMPOSITE COATING WILL BE SUPPLIED BY ANTI-CORROSION DEPARTMENT (ANTI-CORROSION SCOPE).

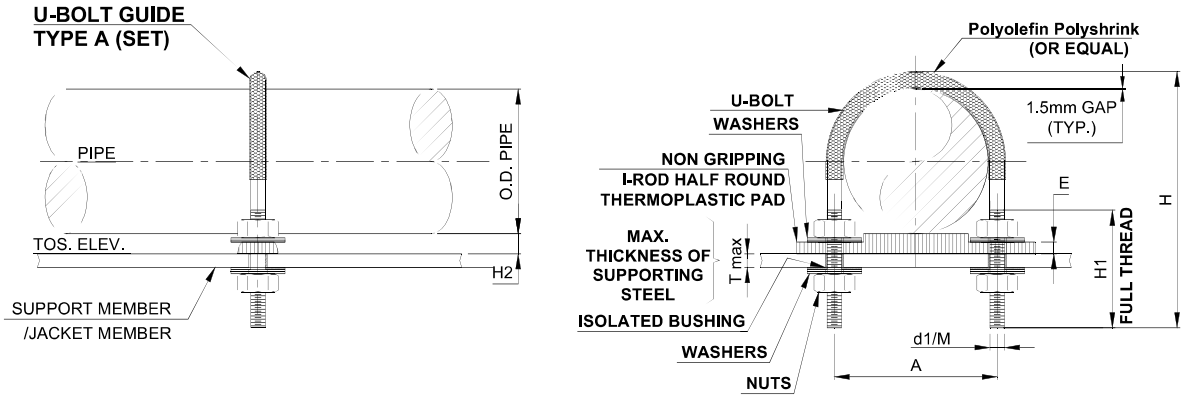
DATASHEET U-BOLT GUIDE (PS-06)		
GENERAL		
1	Type	U-bolt Guide – PS06 (refer VSP-NIPI-TYP-TS-PI1-GEN-01) **- U-bolt Guide (PS06) type A**: for normal pipe (only painting). **- U-bolt Guide (PS06) type B**: for pipe with composite added (total coat. ~2.5mm thickness by anti-corrosion department). Type as per Purchase requisition document (Project applied).
2	Support Pipe Size	as per Purchase requisition document (Project applied)
3	Quantity	as per Purchase requisition document (Project applied)
U-BOLT SUPPORT DESCRIPTION		
4		**PS-06** **U-BOLT GUIDE**  **Item 1: U-bolt insulated with Polyolefin Polyshrink** **Item 2: Nuts (04 pcs)** **Item 3: plated steel Washer (04 pcs)** **Item 3a: insulating Washer (04 pcs if any)** **Item 4: Isolated bushing (02 pcs)** **Item 5: Non Gripping Half round I-rod Pad (01 Pc)**
5	Item 1	U-bolt (01 pc): PTFE coated / hot-dip galvanized or equal (as per Purchase requisition), insulated with Polyolefin Polyshrink to nuts, dimensions are based on "Nu-Bolt" Engineering. U-bolt: -ASTM A36 for support pipe Carbon Steel -SS316 for support pipe Stainless Steel (as per Purchase requisition)
6	Item 2	U-bolt Nut (04 pcs): PTFE coated/ hot-dip galvanized or equal (as per Purchase requisition), Nuts: -ASTM A36 for support pipe Carbon Steel -SS316 for support pipe Stainless Steel (as per Purchase requisition)
7	Item 3	3mm thk. Plated steel Washer (04 pcs), PTFE coated / hot-dip galvanized (as per Purchase requisition)
8	Item 3a	3mm thk. insulating washer (04 pcs if any - as per Purchase requisition), PTFE or Glass reinforced epoxy resin G10
9	Item 4	Isolated bushing (02 pcs), PTFE or Glass reinforced epoxy resin G10 Can be installed from the top (through i-rod + structural support member, sleeve length / depth required increases), Vendor to Advice
10	Item 5	Non-Gripping Half round I-rod Pad (01 pc or 02pcs_special case as per Purchase requisition) Teflon pad (White) Maximum Operating Temperature 83°C. Weight Load on the I-rod at each Pipe Support : as per Purchase requisition
11	Dimension (mm)	See Drawing typical page 8,9, VTA - note 2,3
12	Weight	VTA
REQUIREMENT		
13	Certificate	Certificate of conformance
14	Marking	as per MSS-SP-25

NOTES

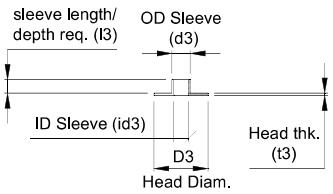
* VTA * Denotes Vendor to advise

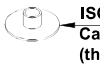
1. Refer to Pipe Support Standard _ VSP-NIPI-TYP-TS-PI1-GEN-01.
2. Drawing PS-06 U-bolt Guide: type A on page 8 & type B on page 9 are for reference, Vendor to advise.
3. Vendor shall furnish detail cross section with dimensions and specify suitable materials, shall be completed with quotation.
4. Refer page 14 for Non-Gripping Half round I-rod Pad's Adhesive information, Vendor to advise.

U-BOLT GUIDE (PS-06) - TYPE A
FOR NORMAL PIPE



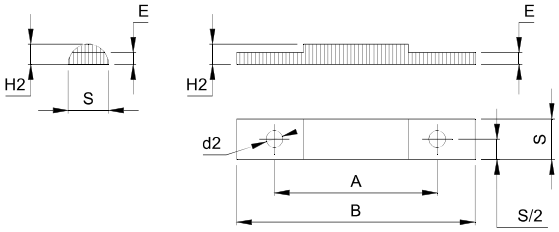
ISOLATED BUSHING





ISOLATED BUSHING (PTFE)
Can be installed from the top
(through i-rod + structural support member,
sleeve length / depth required increases), Vendor Advice

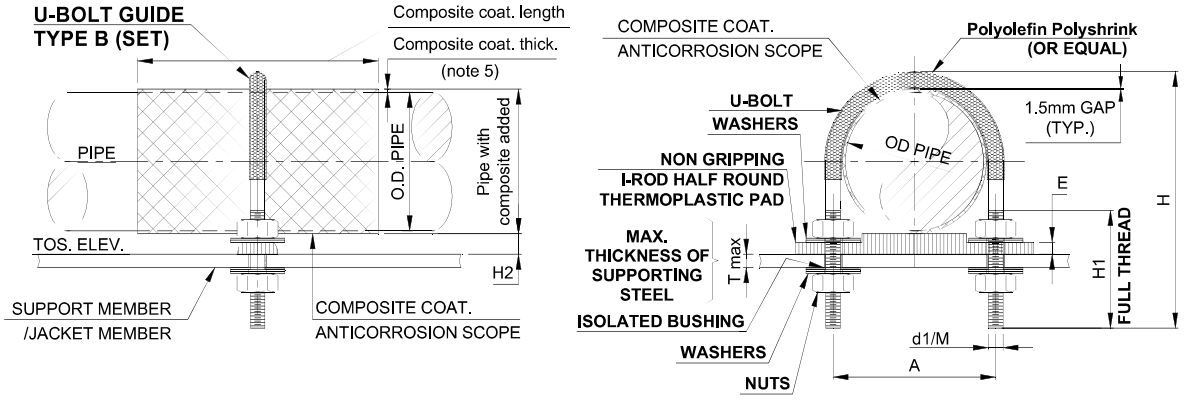
NON-GRIPPING HALF ROUND I-ROD THERMOPLASTIC PAD



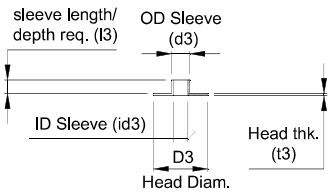
PIPE SIZE		T max note 2	U-BOLT (NOTE 1)							NON-GRIPPING I-ROD (NOTE 1)					ISOLATED BUSHING (NOTE 1)				
			d1		A	H	L	H1	MAX. LOAD	B	S	H2	E	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/2"	Ø21.3	10	1/4"	M6	31	80	180	60	220	60	20	10	5	9	8	6.1		12.2	2
3/4"	Ø26.7	10	1/4"	M6	37	84	190	60	220	70	20	10	5	9	8	6.1		12.2	2
1"	Ø33.4	10	3/8"	M10	47	87	200	60	550	76	25	12.5	6	13	12	10.1		24	2
1 1/2"	Ø48.3	10	3/8"	M10	62	102	240	64	550	102	25	12.5	6	13	12	10.1		24	2
2"	Ø60.3	10	3/8"	M10	74	114	270	64	550	114	25	12.5	6	13	12	10.1		24	2
2 1/2"	Ø73.0	16	1/2"	M14	91	133	320	76	1025	128	25	12.5	6	17	16	14.1	5	30	3
3"	Ø88.9	16	1/2"	M14	107	148	355	76	1025	152	25	12.5	6	17	16	14.1	to	30	3
4"	Ø114.3	16	1/2"	M14	132	173	420	76	1025	178	25	12.5	6	17	16	14.1	30	30	3
6"	Ø168.3	16	5/8"	M16	188	241	590	95	1640	230	25	12.5	6	19	18	16.1	(see	34.5	3
8"	Ø219.1	20	5/8"	M16	239	292	720	95	1640	280	25	12.5	6	19	18	16.1	requ.	34.5	3
10"	Ø273.1	20	3/4"	M20	297	351	870	102	2460	344	38	19	10	23	22	20.2	purc.	36	3
12"	Ø323.9	20	7/8"	M24	355	408	1015	108	3420	406	38	19	10	28	27	24.2	&	44	3
14"	Ø355.6	20	7/8"	M24	387	440	1100	108	3420	432	38	19	10	28	27	24.2	note	44	3
16"	Ø406.4	20	7/8"	M24	437	491	1230	108	3420	484	38	19	10	28	27	24.2	1, 2)	44	3
18"	Ø457.0	20	1"	M27	491	551	1380	121	4500	550	38	19	10	31	30	27.5		50	3
20"	Ø508.0	20	1"	M27	542	602	1510	121	4500	600	38	19	10	31	30	27.5		50	3
24"	Ø610.0	20	1"	M27	644	703	1770	121	4500	700	38	19	10	31	30	27.5		50	3
26"	Ø660.0	20	1"	M27	694	754	1900	121	4500	750	38	19	10	31	30	27.5		50	3
28"	Ø711.0	20	1"	M27	745	805	2030	121	4500	800	38	19	10	31	30	27.5		50	3

NOTES:
1. **U-BOLT, NON-GRIPPING I-ROD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION, AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR.**
2. **WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.**
3. **I-ROD ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.**
4. **INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.**

U-BOLT GUIDE (PS-06) - TYPE B
FOR PIPE WITH COMPOSITE ADDED (NOTE 5)

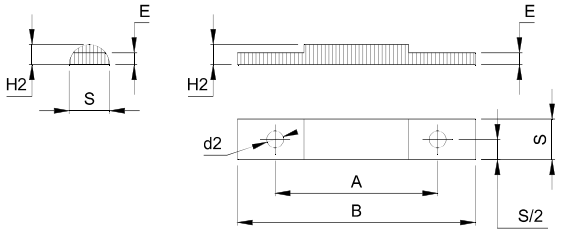


ISOLATED BUSHING



ISOLATED BUSHING (PTFE)
Can be installed from the top
(through i-rod + structural support member,
sleeve length / depth required increases), Vendor Advice

NON-GRIPPING HALF ROUND I-ROD THERMOPLASTIC PAD

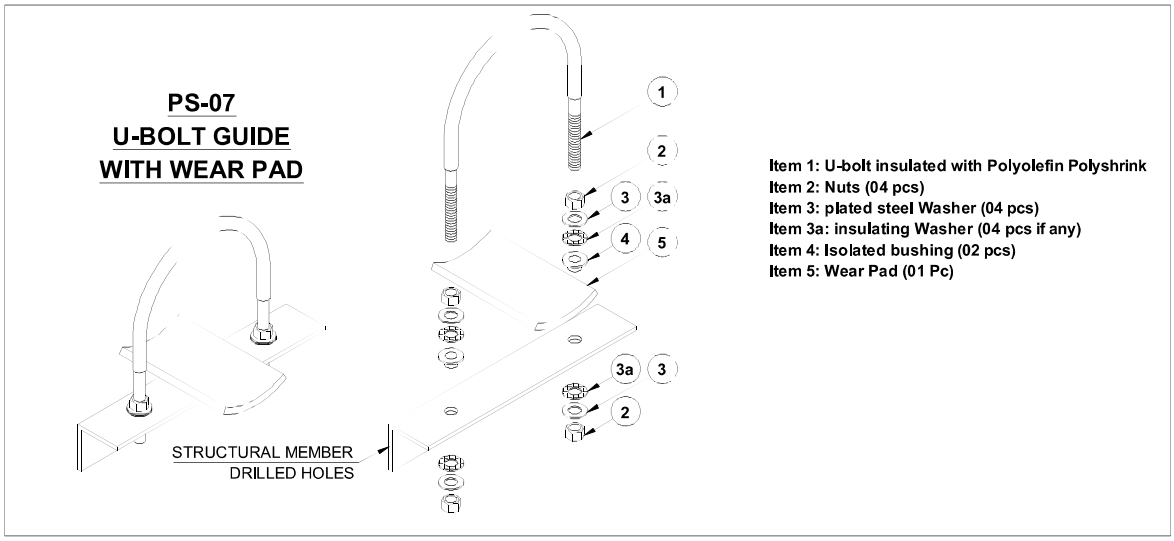


PIPE SIZE		T max note 2	U-BOLT (NOTE 1)							NON-GRIPPING I-ROD (NOTE 1)					ISOLATED BUSHING (NOTE 1)				
			d1		A	H	L	H1	MAX. LOAD	B	S	H2	E	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
2"	Ø60.3	10	3/8"	M10	79	119	280	64	550	120	25	12.5	6	13	12	10.1		24	2
2 1/2"	Ø73.0	16	1/2"	M14	96	138	330	76	1025	136	25	12.5	6	17	16	14.1	5	30	3
3"	Ø88.9	16	1/2"	M14	112	153	365	76	1025	158	25	12.5	6	17	16	14.1	to	30	3
4"	Ø114.3	16	1/2"	M14	137	178	430	76	1025	184	25	12.5	6	17	16	14.1	30	30	3
6"	Ø168.3	16	5/8"	M16	193	246	600	95	1640	236	25	12.5	6	19	18	16.1	(see	34.5	3
8"	Ø219.1	20	5/8"	M16	244	297	730	95	1640	290	25	12.5	6	19	18	16.1	requ.	34.5	3
10"	Ø273.1	20	3/4"	M20	302	356	880	102	2460	350	38	19	10	23	22	20.2	purc.	36	3
12"	Ø323.9	20	7/8"	M24	360	413	1025	108	3420	410	38	19	10	28	27	24.2	&	44	3
14"	Ø355.6	20	7/8"	M24	392	445	1110	108	3420	440	38	19	10	28	27	24.2	note	44	3
16"	Ø406.4	20	7/8"	M24	442	496	1240	108	3420	490	38	19	10	28	27	24.2	1, 2)	44	3
18"	Ø457.0	20	1"	M27	496	556	1390	121	4500	550	38	19	10	31	30	27.5		50	3
20"	Ø508.0	20	1"	M27	547	607	1520	121	4500	600	38	19	10	31	30	27.5		50	3
24"	Ø610.0	20	1"	M27	649	708	1780	121	4500	700	38	19	10	31	30	27.5		50	3
26"	Ø660.0	20	1"	M27	699	759	1910	121	4500	750	38	19	10	31	30	27.5		50	3
28"	Ø711.0	20	1"	M27	750	810	2040	121	4500	800	38	19	10	31	30	27.5		50	3

NOTES:

1. U-BOLT, NON-GRIPPING I-ROD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION, AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR.
2. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.
3. I-ROD ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
4. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.
5. FOR PROTECTION OF PIPING SYSTEMS (PIPE 2" ABOVE) FROM CORROSION UNDER SUPPORTS, COMPOSITE APPLICATION (TOTAL COATED ~2.5mm THICKNESS) SHOULD BE ADDED WITH LENGTH:
   - + PIPE 2" ÷ 6" : LENGTH WILL BE 200mm;
   - + PIPE 8" ABOVE : LENGTH WILL BE 300mm;
   - + IN SOME SPECIAL CASES (NOT ENOUGH SPACING), THE COMPOSITE LENGTH MAY BE min.100mm.

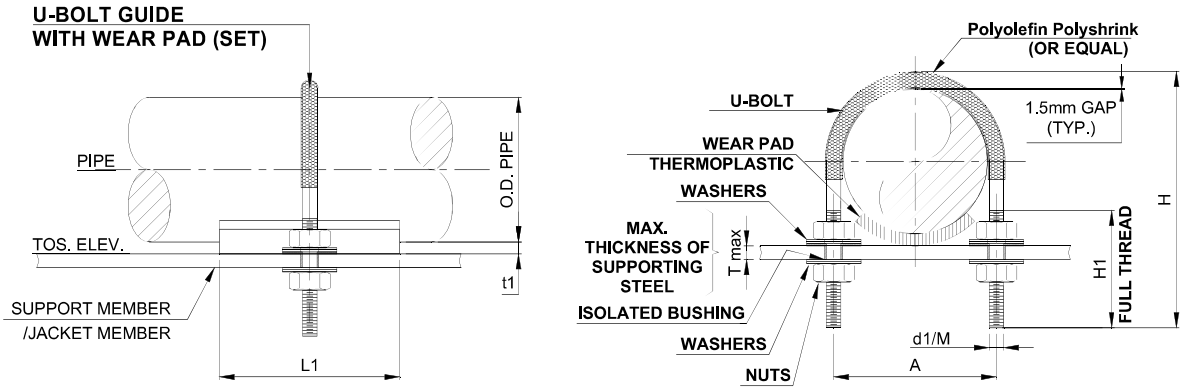
   COMPOSITE COATING SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE 80°C.
   THIS COMPOSITE COATING WILL BE SUPPLIED BY ANTI-CORROSION DEPARTMENT (ANTI-CORROSION SCOPE).

DATASHEET U-BOLT GUIDE WITH WEAR PAD (PS-07)		
GENERAL		
1	Type	U-bolt Guide with Wear Pad – PS07 (refer VSP-NIPI-TYP-TS-PI1-GEN-01)
2	Support Pipe Size	as per Purchase requisition document (Project applied)
3	Quantity	as per Purchase requisition document (Project applied)
U-BOLT SUPPORT DESCRIPTION		
4		
5	Item 1	U-bolt (01 pc): PTFE coated / hot-dip galvanized or equal (as per Purchase requisition), insulated with Polyolefin Polyshrink to nuts, dimensions are based on "Nu-Bolt" Engineering. U-bolt: -ASTM A36 for support pipe Carbon Steel -SS316 for support pipe Stainless Steel (as per Purchase requisition)
6	Item 2	U-bolt Nut (04 pcs): PTFE coated/ hot-dip galvanized or equal (as per Purchase requisition), Nuts: -ASTM A36 for support pipe Carbon Steel -SS316 for support pipe Stainless Steel (as per Purchase requisition)
7	Item 3	3mm thk. Plated steel Washer (04 pcs), PTFE coated / hot-dip galvanized (as per Purchase requisition)
8	Item 3a	3mm thk. insulating washer (04 pcs if any - as per Purchase requisition), PTFE or Glass reinforced epoxy resin G10
9	Item 4	Isolated bushing (02 pcs), PTFE or Glass reinforced epoxy resin G10 Can be installed from the top / bottom of structural member, Vendor to Advice
10	Item 5	Wear Pad (01 pc) Maximum Operating Temperature 83°C. Thermal Plastic/ PTFE or Glass reinforced epoxy resin G10 Weight Load on the Wear Pad at each Pipe Support : as per Purchase requisition
11	Dimension (mm)	See Drawing typical page 9, VTA - note 2,3
12	Weight	VTA
REQUIREMENT		
13	Certificate	Certificate of conformance
14	Marking	as per MSS-SP-25
NOTES		

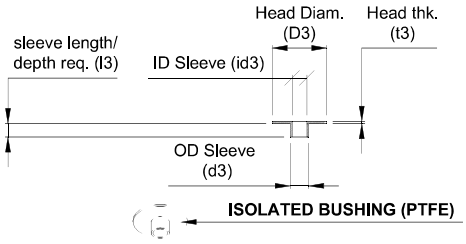
* VTA * Denotes Vendor to advise

1. Refer to Pipe Support Standard _ VSP-NIPI-TYP-TS-PI1-GEN-01.
2. Drawing PS-07 U-bolt Guide with Wear pad on page 11 be for reference, Vendor to advise.
3. Vendor shall furnish detail cross section with dimensions and specify suitable materials, shall be completed with quotation.
4. Refer page 14 for Wear Pad's Adhesive information, Vendor to advise.

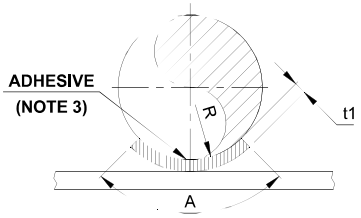
U-BOLT GUIDE WITH WEAR PAD (PS-07)



ISOLATED BUSHING



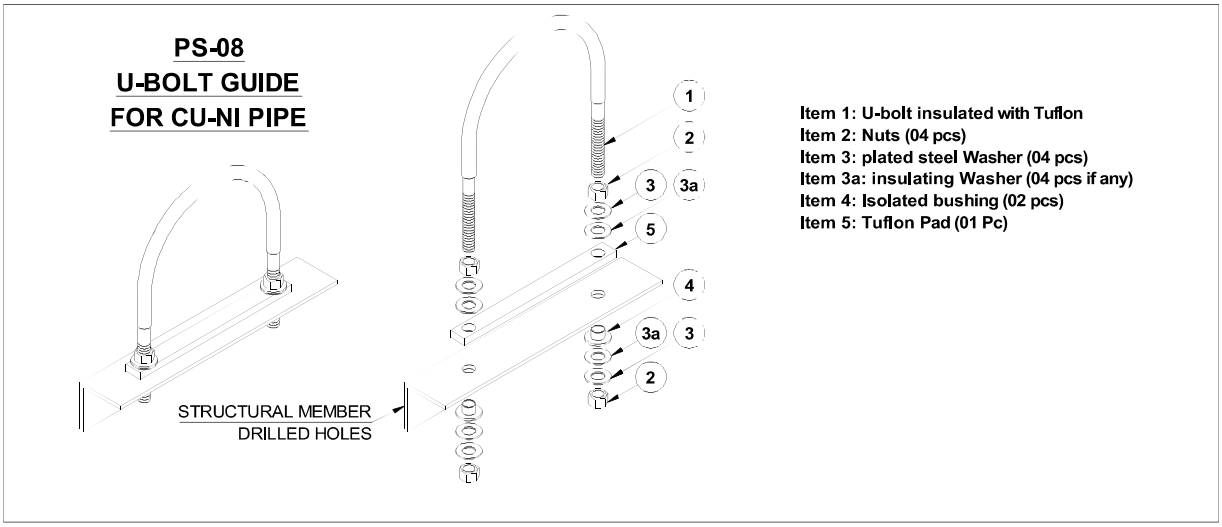
WEAR PAD



PIPE SIZE		T max note 2	U-BOLT (NOTE 1)							WEAR PAD (NOTE 1)				ISOLATED BUSHING (NOTE 1)				
			d1		A	H	L	H1	MAX. LOAD	R	A	t1	L1	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	deg.	mm	mm	mm	mm	mm	mm	mm
1/2"	Ø21.3	10	1/4"	M6	31	80	180	60	220	10.6	90°	6		8	6.1		12.2	2
3/4"	Ø26.7	10	1/4"	M6	37	84	190	60	220	13.3	90°	6		8	6.1		12.2	2
1"	Ø33.4	10	3/8"	M10	47	87	200	60	550	16.7	90°	6		12	10.1		24	2
1 1/2"	Ø48.3	10	3/8"	M10	62	102	240	64	550	24.1	90°	6	100	12	10.1		24	2
2"	Ø60.3	10	3/8"	M10	74	114	270	64	550	30.1	90°	6	Note	12	10.1		24	2
2 1/2"	Ø73.0	16	1/2"	M14	91	133	320	76	1025	36.5	90°	6	3	16	14.1	5	30	3
3"	Ø88.9	16	1/2"	M14	107	148	355	76	1025	44.4	90°	6		16	14.1	to	30	3
4"	Ø114.3	16	1/2"	M14	132	173	420	76	1025	57.1	90°	6		16	14.1	30	30	3
6"	Ø168.3	16	5/8"	M16	188	241	590	95	1640	84.1	60°	6	200	18	16.1	(see	34.5	3
8"	Ø219.1	20	5/8"	M16	239	292	720	95	1640	109.5	60°	6	Note 3	18	16.1	requ.	34.5	3
10"	Ø273.1	20	3/4"	M20	297	351	870	102	2460	136.5	60°	6		22	20.2	purc.	36	3
12"	Ø323.9	20	7/8"	M24	355	408	1015	108	3420	164.9	30°	6		27	24.2	&	44	3
14"	Ø355.6	20	7/8"	M24	387	440	1100	108	3420	177.8	30°	6		27	24.2	note	44	3
16"	Ø406.4	20	7/8"	M24	437	491	1230	108	3420	203.2	30°	6	300	27	24.2	1, 2)	44	3
18"	Ø457.0	20	1"	M27	491	551	1380	121	4500	228.5	30°	6	Note	30	27.5		50	3
20"	Ø508.0	20	1"	M27	542	602	1510	121	4500	254.0	30°	6	3	30	27.5		50	3
24"	Ø610.0	20	1"	M27	644	703	1770	121	4500	305.0	30°	10		30	27.5		50	3
26"	Ø660.0	20	1"	M27	694	754	1900	121	4500	330.0	30°	10		30	27.5		50	3
28"	Ø711.0	20	1"	M27	745	805	2030	121	4500	355.5	30°	10		30	27.5		50	3

NOTES:

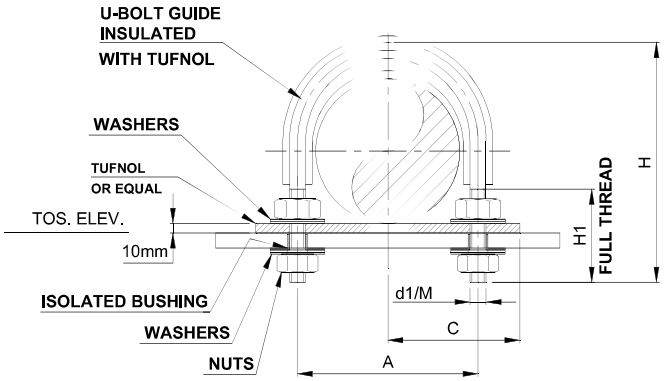
1. U-BOLT, WEAR PAD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION, AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR. WEAR PAD TO BE BONDED TO PIPE.
2. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.
3. ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR. ADHESIVE IS USED TO FORM A PERIMETER SEAL AROUND WEAR PADS TO ENSURE A SECURE BOND AND SEAL FOR NONE WATER PENETRATION.
4. IN CASE OF NECESSITY, HEAT SHRINK SLEEVE MAY BE USED TO PROTECT WATERPROOF.
5. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.

DATASHEET U-BOLT GUIDE FOR CU-NI PIPE (PS-08)		
GENERAL		
1	Type	U-bolt Guide for Cu-Ni pipe – PS08 (refer VSP-NIPI-TYP-TS-PI1-GEN-01): **- U-bolt Guide (PS08) type A**: for normal Cu-Ni pipe (only painting). **- U-bolt Guide (PS08) type B**: for Cu-Ni pipe with composite added (total coat. ~2.5mm thickness by anti-corrosion department). Type as per Purchase requisition document (Project applied).
2	Support Pipe Size	as per Purchase requisition document (Project applied)
3	Quantity	as per Purchase requisition document (Project applied)
U-BOLT SUPPORT DESCRIPTION		
4		
5	Item 1	U-bolt (01 pc): PTFE coated / hot-dip galvanized or equal (as per Purchase requisition), insulated with Tuflon to nuts, dimensions are based on "Nu-Bolt" Engineering. U-bolt: ASTM A36 (as per Purchase requisition)
6	Item 2	U-bolt Nut (04 pcs): PTFE coated/ hot-dip galvanized or equal (as per Purchase requisition), Nuts: ASTM A36 (as per Purchase requisition)
7	Item 3	3mm thk. Plated steel Washer (04 pcs), PTFE coated / hot-dip galvanized (as per Purchase requisition)
8	Item 3a	3mm thk. insulating washer (04 pcs if any - as per Purchase requisition), PTFE or Glass reinforced epoxy resin G10
9	Item 4	Isolated bushing (02 pcs), PTFE or Glass reinforced epoxy resin G10 Can be installed from the top (through tuflon Pad + structural support member, sleeve length / depth required increases), Vendor to Advice
10	Item 5	Tuflon standard Pad (01 pc or 02pcs as per Purchase requisition in special case) Tuflon (White), Maximum Operating Temperature 83°C. Weight Load on the Tuflon Pad at each Pipe Support : as per Purchase requisition
11	Dimension (mm)	See Drawing typical page 13,14, VTA - note 2,3
12	Weight	VTA
REQUIREMENT		
13	Certificate	Certificate of conformance
14	Marking	as per MSS-SP-25
NOTES		

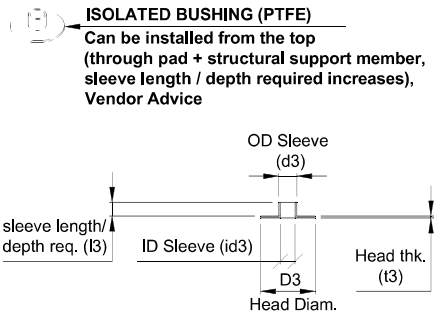
* VTA * Denotes Vendor to advise

1. Refer to Pipe Support Standard _ VSP-NIPI-TYP-TS-PI1-GEN-01.
2. Drawing PS-08 U-bolt Guide for Cu-Ni Pipe on page 13 be for reference, Vendor to advise.
3. Vendor shall furnish detail cross section with dimensions and specify suitable materials, shall be completed with quotation.
4. Refer page 14 for Tuflon standard Pad's Adhesive information, Vendor to advise.

U-BOLT GUIDE FOR CU-NI PIPE (PS-08)



ISOLATED BUSHING



U-BOLT GUIDE (PS-08) - TYPE A FOR CU-NI PIPE (NORMAL)

PIPE SIZE		T max note 2	U-BOLT (NOTE 1)							TUFNOL (NOTE 1)		ISOLATED BUSHING (NOTE 1)				
			d1		A	H	L	H1	MAX. LOAD	c	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm
1/2"	Ø16	10	1/4"	M6	26	75	165	60	220	30	9	8	6.1		12.2	2
3/4"	Ø25	10	1/4"	M6	35	80	180	60	220	35	9	8	6.1	5	12.2	2
1"	Ø30	10	3/8"	M10	44	84	200	60	550	38	13	12	10.1	to	24	2
1 1/2"	Ø44.5	10	3/8"	M10	59	102	240	64	550	51	13	12	10.1	30	24	2
2"	Ø57	10	3/8"	M10	71	114	270	64	550	57	13	12	10.1	(see	24	2
2 1/2"	Ø76.1	16	1/2"	M14	95	130	320	76	1025	64	17	16	14.1	requ.	30	3
3"	Ø88.9	16	1/2"	M14	107	150	360	76	1025	76	17	16	14.1	purc.	30	3
4"	Ø108	16	1/2"	M14	126	175	420	76	1025	89	17	16	14.1	&	30	3
6"	Ø159	16	5/8"	M16	180	245	590	95	1640	115	19	18	16.1	note	34.5	3
8"	Ø219.1	20	5/8"	M16	240	292	720	95	1640	140	19	18	16.1	1, 2)	34.5	3
10"	Ø267	20	3/4"	M20	292	351	870	102	2460	172	23	22	20.2		36	3
12"	Ø323.9	20	7/8"	M24	353	408	1015	108	3420	203	28	27	24.2		44	3

U-BOLT GUIDE (PS-08) - TYPE B FOR CU-NI PIPE WITH COMPOSITE ADDED (NOTE 5)

PIPE SIZE		T max note 2	U-BOLT (NOTE 1)							TUFNOL (NOTE 1)		ISOLATED BUSHING (NOTE 1)				
			d1		A	H	L	H1	MAX. LOAD	c	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm
2"	Ø57	10	3/8"	M10	76	119	280	64	550	60	13	12	10.1	5 to	24	2
2 1/2"	Ø76.1	16	1/2"	M14	100	135	330	76	1025	67	17	16	14.1	30	30	3
3"	Ø88.9	16	1/2"	M14	112	155	370	76	1025	79	17	16	14.1	(see	30	3
4"	Ø108	16	1/2"	M14	131	180	430	76	1025	92	17	16	14.1	requ.	30	3
6"	Ø159	16	5/8"	M16	185	250	600	95	1640	118	19	18	16.1	purc.	34.5	3
8"	Ø219.1	20	5/8"	M16	245	297	730	95	1640	142	19	18	16.1	&	34.5	3
10"	Ø267	20	3/4"	M20	297	356	880	102	2460	175	23	22	20.2	note	36	3
12"	Ø323.9	20	7/8"	M24	358	413	1025	108	3420	205	28	27	24.2	1, 2)	44	3

NOTES:

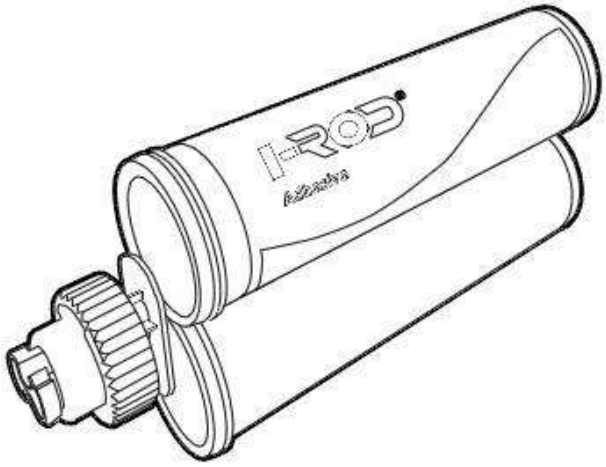
1. U-BOLT, TEFLON PAD AND ISOLATED BUSHING DIMENSIONS BE ONLY FOR REFERENCE, REFER PURCHASE REQUIREMENT FOR MORE INFORMATION, AND THESE DIMENSION SHALL BE CONFIRMED BY VENDOR.
2. WHERE SUPPORTING STEEL IS THICKER OR HEAVIER, DIMENSIONS "H" U-BOLT HEIGHT SHALL BE INCREASED ACCORDINGLY.
3. ADHESIVE SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE AND SHALL BE SUPPLIED BY VENDOR.
4. INSTALLATION PROCEDURE SHALL BE FOLLOWED BY VENDOR.
5. FOR PROTECTION OF PIPING SYSTEMS (PIPE 2" ABOVE) FROM CORROSION UNDER SUPPORTS, COMPOSITE APPLICATION (TOTAL COATED ~2.5mm THICKNESS) SHOULD BE ADDED WITH LENGTH:
   + PIPE 2" ÷ 6" : LENGTH WILL BE 200mm;
   + PIPE 8" ABOVE : LENGTH WILL BE 300mm;
   + IN SOME SPECIAL CASES (NOT ENOUGH SPACING), THE COMPOSITE LENGTH MAY BE min.100mm.

   COMPOSITE COATING SHALL BE COMPATIBLE WITH MAXIMUM OPERATING TEMPERATURE 80°C.
   THIS COMPOSITE COATING WILL BE SUPPLIED BY ANTI-CORROSION DEPARTMENT (ANTI-CORROSION SCOPE).

ADHESIVE INFORMATION (VENDOR TO ADVISE)

General

I-Rod® Adhesive is a high-strength, two-component methacrylate adhesive designed to quickly bond I-Rod® thermoplastic materials to pipe supports without pretreating their clean surfaces. It is applied with an applicator using a 1:1 mix ratio, and is non-flammable once cured. One 400 mL cartridge will apply 0.021" of adhesive to 10' of 0.75" (I-Rod® Classic) on bare steel, painted steel and concrete. It is best used by the date specified on the packaging. Room temperature cure time is listed. For applications below room temperature, time to full strength is increased. I-Rod Adhesive should not be used on high-heat installations exceeding 83ºC (181ºF), even if I-Rod HT or PEEK is used.



Shore hardness STM-707 (ASTM D 2240)

Durometer D	39

Full coverage on I-Rod Classic

Cartridge size	I-Rod diameter	Length
400mL	0.75"	10'
400mL	1"	7.5'
400mL	1.5"	5'

Fixture time

Time needed to develop sheer strength of 0.1 N/mm²	
Fixture time, ISO4587:	10 to 20 minutes

Properties of uncured material (when mixed)

Specific gravity at 25º C	0.99
Working time at 25ºC:	7 min.
Flash point	95ºC (203º F)

Product characteristics

Appearance (mixture)	Pale yellow
Cure	Room temperature cure
Components	Two component - requires mixing
Mix ratio, by volume –	
Part A: Part B	1 : 1
Working time	7 minutes

Temperature limits

I-Rod Adhesive functions well within the temperature limits of I-Rod Classic, but is not recommended for high-temperature use with I-Rod HT or PEEK.

Lowest	Highest
-110ºC (-166ºF)	83ºC (181ºF)

I-Rod (white) lap shear strength (psi)

Concrete	1,400 - 1,700
Steel	2,500 - 3,000

I-Rod (white) tensile strength (psi)

Concrete	500 - 600
Steel	700 - 800

Chemical / solvent resistance at 22ºC

(Aged under these conditions) Environment	ºC	% Strength 500 hours	% Strength 1,000 hours
100% RH	49	130	120
Salt fog, 95% RH	35	115	130
Water	22	120	105
Unleaded gasoline	22	Not recommended	Not recommended
Motor oil (10W30)	22	100	90
Waterfulvool 50/50	22	120	115
DEF (AdBlue®)	22	125	145
Sulfuric Acid, 10%	22	100	105
Ammonia	22	120	110

Adhesive properties of material cured for 72 hours at 21ºC

Impact strength (ISO 9653)		
21º C	5.8 J	
100º C	3.2 J	
-40º C	6.1 J	
"T" Peel strength (ISO 11339)		
Steel	N/mm (lb/in)	8 (45)
Aluminum	N/mm (lb/in)	2 (12)

VIETSOVPETRO	**RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS**	VIETSOVPETRO RESEARCH & ENGINEERING INSTITUTE

PROJECT NAME : **INSTALLATION OF A PRESSURE CONTROL VALVE (PCV) AT THE OUTLET OF THE DAI HUNG GAS COMPRESSOR**

DOCUMENT TITLE : **DATASHEET FOR PRESSURE CONTROL VALVES**

DOCUMENT NO. : **BK.TNG-087-TS-PI1-DS-001**

PHASE : **DDM**

AGREED	Signed by: Bùi Quang Thuận Date: 19/01/2026 14:48:17 Certified by: Vietsovpetro CA	Signed by: Nguyễn hải Chung Date: 19/01/2026 10:43:06 Certified by: Vietsovpetro CA
	PROCESS: B.Q.THUAN	**INSTRUMENT: N.H.CHUNG**

			Signed by: Vũ Thị Mơ Date: 19/01/2026 15:48:03 Certified by: Vietsovpetro CA CONTROLLED	Signed by: Nguyễn Ngọc Tiệp Date: 20/01/2026 07:26:21 Certified by: Vietsovpetro CA	Signed by: Trần Duy Hải Date: 20/01/2026 08:32:20 Certified by: Vietsovpetro CA
			DC: V.T.MO	**ENG.MGR: N.N.TIEP**	**PRO.MGR: T.D.HAI**
			Signed by: Trần Kim Thành Date: 16/01/2026 15:16:19 Certified by: Vietsovpetro CA	Signed by: Phạm Công Phú Date: 16/01/2026 15:28:13 Certified by: Vietsovpetro CA	Signed by: Trương Minh Đức Date: 19/01/2026 14:55:57 Certified by: Vietsovpetro CA
0	IFA	09/01/2026			
REV.	**DES.**	**DATE**	**PREPARED: T.K.THANH**	**CHECKED:P.C.PHU**	**DEPT.MGR. T.M.DUC**

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TRACK CHANGES

No.	Rev.	Content of Change	Note
1	0	Issued for Approved	

GENERAL	1	TAG No.		25PV-1008/1009				
	2	QUANTITY OF VALVE		2				
	3	SERVICE		DH Compressed Gas to TEG Contactor Inlet Scrubber				
	4	FLUID TYPE		Process Gas				
	5	P&ID NO.		BK.TNG-087-TS-PR1-PID-011				
	6	LINE NO. (IN/OUT)		Inlet 25PV1008: PG-10"-BC01-25185-N Inlet 25PV1009: PG-10"-BC01-25187-N		Outlet 25PV1008: PG-10"-BC01-25186-N Outlet 25PV1009: PG-10"-BC01-25188-N		
	7	LINE SIZE & SCHEDULE INLET / OUTLET		10" Sch40, ASTM A106 Gr.B		10" Sch40, ASTM A106 Gr.B		
	8	CORROSION ALLOWANCE		3 mm				
	9	INSULATION		No (Painting only)				
BODY	10	TYPE OF BODY / VALVE CODE		GLOBE / GLB4AH				
	11	DESIGN PRESSURE	DESIGN TEMPERATURE	42.2 (Barg)		0/100 deg.C		
	12	BODY SIZE	PORT SIZE	8" (VTC) (Note 4)		8" (VTC) (Note 4)		
	13	TRIM TYPE		Balanced cage-guided (VTA)				
	14	CHARACTERISTIC		Equal Percentage				
	15	FLOW DIRECTION		VTC - to be specified on valve drawing				
	16	RATING & END CONNECTION		RF Flanges 300#, ASME B16.5				
	17	BODY MATERIAL		ASTM A216 WCB or equal				
	18	PACKING MATERIAL		Suitable for service condition (VTC)				
	19	LUBRICATOR	ISOLAT. VALVE	VTA		VTA		
	20	BONNET STYLE		Bolted Bonnet				
	21	BOLTING / NUTS MATERIAL		ASTM 193 Gr.B7 / ASTM 194 Gr.B7 Xylan Fluorocarbon Coated				
	22	TRIM MATERIAL: SEAT / PLUG / CAGE		ASTM A182 F6 + Stellite #6				
	23	STEM / SHAFT MATERIAL		ASTM A182 F6 or equal				
	24	REQUIRED SEAT TIGHTNESS/ LEAKAGE CLASS		CLASS IV				
	25	MATERIAL CERTIFICATE		EN10204-2004 3.1 including Pressure Test Result				
	26	MAX ALLOW SOUND LEVEL		< 85 dBA				
ACTUATOR	27	MODEL No. & SIZE		VTA				
	28	DRIVE FLUID		INSTRUMENT AIR				
	29	TYPE OF ACTUATOR		PNEUMATIC SPRING & DIAPHRAGM				
	30	FLOW ACTION TO		VTA				
	31	FAIL POSITION		FAIL OPEN				
	32	ACTUATOR ORIENT.	PNEUMATIC CONNECTION	VTC		1/4" NPT-F		
	33	ENCLOSURE CLASS	ENCLOSURE MATERIAL	MIN. IP56		Carbon steel		
	34	HANDWHEEL & LOCATION		-				
I/P POSITIONER	35	TYPE		ELECTROPNEUMATIC SMART TYPE				
	36	TAG NUMBER		25PY-1008/1009				
	37	SUPPLY MEDIUM		INSTRUMENT AIR				
	38	SUPPLY PRES.: MIN	MAX	4 Barg		8 Barg		
	39	INPUT SIGNAL	OUTPUT SIGNAL	4~20 mA HART		6-30 psig		
	40	CONN.: PNEUMATIC	ELECTRICAL	1/2" NPT-F		1/2 NPT-F		
	41	ON INCREASING INPUT, SIGNAL OUTPUT		INCREASE				
	42	AREA CLASSIFICATION		Class I, Zone 2, IIA T3				
	43	GAUGE		SUPPLY / OUTPUT / INPUT				
	44	FILTER REGULATOR		YES (316 SS)				
	45	CAM CHARACTERISTIC	EX. PROTECTION	VTA		Ex'd'		
	46	ENCLOSURE CLASS	ENCLOSURE MATERIAL	MIN. IP56		SS316		
	47	MANUFACTURER	MODEL No.	VTC		VTC		
SOLENOID VALVE	48	SOLENOID VALVE TAG No.		N/A				
	49	MANUFACTURER	MODEL No.	N/A		N/A		
	50	TYPE		N/A				
	51	QUANTITY	MATERIAL	N/A		N/A		
	52	RESET TYPE	SUPPLY VOLTAGE	N/A		N/A		
	53	IP RATINGS	ELECTRICAL CONNECTION	N/A		N/A		
	54	AREA CLASSIFICATION/ CERTIFICATION		N/A				
AIR SET	55	MANUFACTURER	MODEL No.	VTA		VTA		
	56	MATERIAL		SS316				
	57	SET PRESSURE		ADJUSTABLE (VTA)				
	58	FILTER	GAUGE	Yes, SS316		Yes, SS316		
TEST	59	HYDRO TEST / ANSI / FCI LEAKAGE CLASS		YES / YES				
	60	VALVE STROKING TEST		YES				
	61	PAINTING		Refer to Doc No. BK.TNG-001-GEN-AZ-SP-02				
SERVICE	62			Min. flow		Normal flow		Max. flow
	63	MASS FLOWRATE (m3/h)		200000		750000		1000000
	64	INLET PRESSURE (Barg)		31.9	31.9	31.9	31.9	31.9	31.9
	65	OUTLET PRESSURE (Barg)		31.0	25.0	31.0	25.0	31.0	25.0
	66	DELTA P (Bar):		0.9	6.9	0.9	6.9	0.9	6.9
	67	INLET TEMPERATURE (oC)		45					
	68	SHUT-OFF PRESSURE (Bar)		42.2					
	69	PSEUDO CRITICAL PRESSURE (Barg)		46.29					
	70	VISCOSITY (cP)		0.0127					
	71	MOLECULAR WEIGHT		22.29					
	72	COMPRESSIBILITY		0.8967					
	73	MASS DENSITY (kg/m3)		30.94					
	74	SPECIFIC HEAT RATIO K (Cp/Cv)		1.358					
	75	VAPOR PRESS Pv :Max (Barg)		-					
	76	FLASHING		VTC					
	77	REQUIRED Cv		57.98	22.39	217.83	84.4	290.77	112.68
	78	RATED Cv		VTC					
	79	VALVE FL		VTC					
	80	TRAVEL		10 - 90 %					
	81	CALCULATED NOISE		VTC					
	82	CALCULATED VALVE OPENING		VTC					
	83	MANUFACTURER & MODEL No.		VTA					

NOTES:

1 Positioner shall be smart type - HART protocol, Weatherproof to minIP-56 and Ex"d", IIC, T3, full diagnostic, modular design, 316 SS housing.

2 Pneumatic instrument air supply is 3/8" OD tubing, Vendor to provide suitable pneumatic tie-in point c/w connector/ accessories for instrument air connection.

3 Manufacturer calculation sheet shall be submitted (with selected body size).

4 In case valve size are different from body valve size in row No.12, suitable eccentric reducers, 02 set of opposite Weld Neck flanges 300# RF, Spiral Wound Gaskets (Accordance with ASME B16.20), Xylan Fluorocarbon Coated bolts/nuts (ASTM A193 B7 / A194 2H) as per Piping class BC01 in Piping Material Class Specification: BK.TNG-001-TS-PI-SP-001" for connecting PCV with pipe inlet & outlet in row 7 must be supplied by vendor.

5 Vendor shall verify, update datasheet as indicated including calculate and rated Cv and be responsible for the sizing and selection of control valve/ actuators, and submit all calculations for purchaser review and also as part of final documentation.

6 Refer to the following project documents for more requirement:
- BK.TNG-002-TS-IN-SP-004: Genenral Specification For Instrument
- BK.TNG-001-TS-PI-SP-001: Piping Material Class Specification
- BK.TNG-001-TS-PI-DS-001 : Specification for Manual Valves
- BK.TNG-001-GEN-AZ-SP-02: Painting specification for platform BK.TNG
- BK.TNG-001-TS-IN-SP-004: General specification for instruments

7 Vendor shall supply Brass/ 316SS plugs suitable for Class 1 Zone 2 IIA T3 hazardous area classification for spare cable entry.

8 Material certification shall be in accordance with EN 1024 3.1

9 Trim design optimized for dirty crude oil with high solid content. Special anti-clogging feature to prevent blockage.

VTA: Vendor To Advise; VTC: Vendor To Confirm; N/A: Not Applicable

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RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

PROJECT NAME : **INSTALLATION OF A PRESSURE CONTROL VALVE (PCV) AT THE OUTLET OF THE DAI HUNG GAS COMPRESSOR**

DOCUMENT TITLE : **CONTROL VALVE SIZING CALCULATION**

DOCUMENT NO. : **BK.TNG-087-TS-PR1-CA-001**

PHASE : **DETAIL DESIGN**

			Signed by: Vũ Thị Mơ Date: 29/01/2026 08:26:00 Certified by: Vietsovpetro CA UNCONTROLLED	Signed by: Nguyễn Ngọc Tiệp Date: 30/01/2026 07:42:47 Certified by: Vietsovpetro CA	Signed by: Trần Duy Hải Date: 30/01/2026 16:06:20 Certified by: Vietsovpetro CA
			DC: V.T.MO	**ENG.MGR: N.N.TIEP**	**PRO. MGR: T.D.HAI**
			Signed by: Mai Trung Thịnh Date: 27/01/2026 17:04:47 Certified by: Vietsovpetro CA	Signed by: Bùi Quang Thuận Date: 29/01/2026 15:35:09 Certified by: Vietsovpetro CA	Signed by: Trương Minh Đức Date: 29/01/2026 16:15:18 Certified by: Vietsovpetro CA
0	IFA	20.01.26			
REV.	**DES.**	**DATE**	**PREPARED: M.T.THINH**	**CHECKED: B.Q.THUAN**	**DEPT.MGR: T.M.DUC**

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TRACK CHANGES

No	Rev.	Content of Change	Note
1	0	Issued for Approval	20.01.26

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1 INTRODUCTION

1.1 Purpose of document

The purpose of this report is to define the required Cv and the size of the control valves for the design engineering of the "Installation of a Pressure Control Valve (PCV) at the outlet of the Dai Hung Gas Compressor".

1.2 Definition and Abbreviation

BK.TNG	Thien Ung Platform
PCV	Pressure Control Valve

1.3 Language

This document is written in the English language.

2 CONTROL VALVE SIZING CALCULATION

Calculation results of control valves are summarized in the Table below:

Table 2.1. Control Valve Sizing Calculation Results

No.	Valve Tag No.	P&ID No.	Sizing Case	Flowrate (MMSCMD)	P - Inlet (barg)	P - Outlet (barg)	Pressure Drop (bara)	Required Cv	Valve Size (inch)
1	25PV1008 and 25PV1009	PID-011	Minimum	0.2	31.9	31	0.9	57.98	8
			Normal	0.75	31.9	31	0.9	217.83	
			Maximum	1	31.9	31	0.9	290.77	
			Minimum	0.2	31.9	25	6.9	22.39	
			Normal	0.75	31.9	25	6.9	84.40	
			Maximum	1	31.9	25	6.9	112.68	

3 APPENDICES

Appendix 1: Control Valve Sizing Calculation (03 Pages).

Văn bản này được xác thực tại https://eoffice.vietsov.com.vn với số định danh: 59/26-CV-XDM/NIPI

APPENDIX 1: CONTROL VALVE SIZING CALCULATION.
(03 pages including this page)

Văn bản này được xác thực tại https://eoffice.vietsov.com.vn với số định danh: 59/26-CV-XDM/NIPI

1) BASIS AND ASSUMPTION

- The control valves 25PV1008 and 25PV1009 are installed at outlet of the Dai Hung Gas Compressor.
- The max.gas flowrate to be calculated is 41507 Sm3/hr (Max. Gas P= 31.9 barg t= 45.0 °C)
- The average gas flowrate to be calculated is 31130 Sm3/hr (Average production P= 31.9 barg t= 45.0 °C)
- The min. gas flowrate to be calculated is 8301 Sm3/hr (Min. Gas P= 31.9 barg t= 45.0 °C)
- Pressure drop across the valve 0.9 bar

2) VALVE SIZING

TAG NUMBER	25PV1008 and 25PV1009
DESCRIPTION	PRESSURE CONTROL VALVE
SERVICE	OUTLET OF DAI DUNG GAS COMPRESSOR
Characteristic	Equal percentage

	Item	Parameters		Min.	Average	Max.	Unit
INPUT DATA	I.1	Flow rate	Volume	8301	31130	41507	Sm3/hr
	I.2	Pipe diameter		**10**	**10**	**10**	inch
	I.3	Assume valve diameter		**8**	**8**	**8**	inch
	I.4	Upstream absolute static pressure	P1	3290	3290	3290	kPa
	I.5	Downstream absolute static pressure	P2	3200.00	3200.00	3200.00	kPa
	I.6	Pressure drop across the valve	ΔP	90.00	90.00	90.00	kPa
	I.7	Absolute upstream temperature	T1	318.15	318.15	318.15	Degree K
	I.8	Molecular weight	M=	22.29	22.29	22.29	
	I.9	Ratio of specific heats	k	1.358	1.358	1.358	
	I.10	Compressibility factor	Z	0.8967	0.8967	0.8967	
	I.11	Ratio of pressure drop to upstream absolute static press.	x	0.027	0.027	0.027	
CALCULATION	II.1	N value from the Equation Constants Table	N9	21.200	21.200	21.200	
	II.2	N2 value from the Equation Constants Table	N2	890	890	890	
	II.3	N5 value from the Equation Constants Table	N5	1000	1000	1000	
	II.4	Rated Cv (arcording to assumed valve size)	Cv	818.0	818.0	818.0	
	II.5	Resistance coefficient of upstream fittings	K_1	0.065	0.065	0.065	
	II.6	Inlet head loss coefficient accounted for effects of reducer	Ki	0.655	0.655	0.655	
	II.7	Head loss coefficient of device	∑K	0.194	0.194	0.194	
	II.8	Piping geometry factor	Fp	0.983	0.983	0.983	
	II.9	Ratio of specific heats factor	Fk	0.970	0.970	0.970	
	II.10	Rated pressure drop ratio factor (without attached fittings)	X_T	0.81	0.81	0.81	**xt(Equal)**
	II.11	X_{TP} accounted for the effects of reducers	X_{TP}	0.772	0.772	0.772	
	II.12	Expansion factor assumed (Y=1-x/(3*Fk*Xt)	Y	0.988	0.988	0.988	
	II.13	Required Cv (Calculated)	Cvr	59.09	221.59	295.45	
	II.14	Valve Open travel percentage (Calculated)	OP (%)	**37**	**66**	**72**	**OK**
	II.16	Initial Cv (=Required Cv)		57.97	217.80	290.71	
	II.17	Rated pressure drop ratio factor (without attached fittings)	X_T	0.929	0.874	0.863	**A(Equal)**
	II.18	Piping geometry factor (for solving arcoding to Solve Cv)	F_p	0.9999	0.999	0.998	
	II.19	X_{TP} accounted for the effects of reducers	X_{TP}	0.929	0.871	0.856	
	II.20	Ratio of pressure drop to upstream absolute static press.	x	0.027	0.027	0.027	
	II.21	Expansion factor assumed (Y=1-x/(3*Fk*Xt)	Y	0.990	0.989	0.989	
	II.22	Calculated Cv		57.98	217.83	290.77	
RESULTS	III.1	**Selected pipe size**	D	**10**	**10**	**10**	inch
	III.2	**Selected valve size**	d	**8**	**8**	**8**	inch
	III.3	**Calculated Head loss coefficient of device**	∑K	**0.194**	**0.194**	**0.194**	
	III.4	**Calculated Piping geometry factor**	Fp	**0.9999**	**0.999**	**0.998**	
	III.5	**Appropriated Cv**	Cv	**57.98**	**217.83**	**290.77**	
	III.6	**Valve Open travel percentage**	OP (%)	**37**	**66**	**72**	**OK**

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1) BASIS AND ASSUMPTION

- The control valves 25PV1008 and 25PV1009 are installed at outlet of the Dai Hung Gas Compressor.
- The max.gas flowrate to be calculated is 41507 Sm3/hr (Max. Gas P= 31.9 barg t= 45.0 °C)
- The average gas flowrate to be calculated is 31130 Sm3/hr (Average production P= 31.9 barg t= 45.0 °C)
- The min. gas flowrate to be calculated is 8301 Sm3/hr (Min. Gas P= 31.9 barg t= 45.0 °C)
- Pressure drop across the valve 6.9 bar

2) VALVE SIZING

TAG NUMBER	25PV1008 and 25PV1009
DESCRIPTION	PRESSURE CONTROL VALVE
SERVICE	OUTLET OF DAI DUNG GAS COMPRESSOR
Characteristic	Equal percentage

	Item	Parameters		Min.	Average	Max.	Unit
INPUT DATA	I.1	Flow rate	Volume	8301	31130	41507	Sm3/hr
	I.2	Pipe diameter		**10**	**10**	**10**	inch
	I.3	Assume valve diameter		**8**	**8**	**8**	inch
	I.4	Upstream absolute static pressure	P1	3290	3290	3290	kPa
	I.5	Downstream absolute static pressure	P2	2600.00	2600.00	2600.00	kPa
	I.6	Pressure drop across the valve	ΔP	690.00	690.00	690.00	kPa
	I.7	Absolute upstream temperature	T1	318.15	318.15	318.15	Degree K
	I.8	Molecular weight	M=	22.29	22.29	22.29	
	I.9	Ratio of specific heats	k	1.358	1.358	1.358	
	I.10	Compressibility factor	Z	0.8967	0.8967	0.8967	
	I.11	Ratio of pressure drop to upstream absolute static press.	x	0.210	0.210	0.210	
CALCULATION	II.1	N value from the Equation Constants Table	N9	21.200	21.200	21.200	
	II.2	N2 value from the Equation Constants Table	N2	890	890	890	
	II.3	N5 value from the Equation Constants Table	N5	1000	1000	1000	
	II.4	Rated Cv (arcording to assumed valve size)	Cv	818.0	818.0	818.0	
	II.5	Resistance coefficient of upstream fittings	K_1	0.065	0.065	0.065	
	II.6	Inlet head loss coefficient accounted for effects of reducer	Ki	0.655	0.655	0.655	
	II.7	Head loss coefficient of device	∑K	0.194	0.194	0.194	
	II.8	Piping geometry factor	Fp	0.983	0.983	0.983	
	II.9	Ratio of specific heats factor	Fk	0.970	0.970	0.970	
	II.10	Rated pressure drop ratio factor (without attached fittings)	X_T	0.81	0.81	0.81	**xt(Equal)**
	II.11	X_{TP} accounted for the effects of reducers	X_{TP}	0.772	0.772	0.772	
	II.12	Expansion factor assumed (Y=1-x/(3*Fk*Xt)	Y	0.911	0.911	0.911	
	II.13	Required Cv (Calculated)	Cvr	23.15	86.83	115.77	
	II.14	Valve Open travel percentage (Calculated)	OP (%)	**17**	**46**	**52**	**OK**
	II.16	Initial Cv (=Required Cv)		22.39	84.40	112.67	
	II.17	Rated pressure drop ratio factor (without attached fittings)	X_T	0.968	0.913	0.901	**A(Equal)**
	II.18	Piping geometry factor (for solving arcoding to Solve Cv)	F_p	1.0000	1.000	1.000	
	II.19	X_{TP} accounted for the effects of reducers	X_{TP}	0.968	0.913	0.900	
	II.20	Ratio of pressure drop to upstream absolute static press.	x	0.210	0.210	0.210	
	II.21	Expansion factor assumed (Y=1-x/(3*Fk*Xt)	Y	0.926	0.921	0.920	
	II.22	Calculated Cv		22.39	84.40	112.68	
RESULTS	III.1	**Selected pipe size**	D	**10**	**10**	**10**	inch
	III.2	**Selected valve size**	d	**8**	**8**	**8**	inch
	III.3	**Calculated Head loss coefficient of device**	∑K	**0.194**	**0.194**	**0.194**	
	III.4	**Calculated Piping geometry factor**	Fp	**1.0000**	**1.000**	**1.000**	
	III.5	**Appropriated Cv**	Cv	**22.39**	**84.40**	**112.68**	
	III.6	**Valve Open travel percentage**	OP (%)	**16**	**45**	**51**	**OK**

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RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

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RESEARCH & ENGINEERING INSTITUTE

PROJECT NAME : **CA TAM OIL FILED DEVELOPMENT PROJECT**
BLOCK 09-03/12
CTC2 WHP AND CONNECT TO CTC1 WHP

DOCUMENT TITLE : **SPECIFICATION FOR CONTROL VALVE**

DOCUMENT NO. : **CTC1.CTC2-002-GE-IA2-SP-005**

PHASE : **DETAILED ENGINEERING**

FOLLOW ON ENGINEERING

JOB NAME :

JOB NUMBER :

Applied Typical Document		VSP-NIPI-TYP-TS-IA2-SP-05			Rev.	0
	CONTROLLED					
0	IFA	04.02.21.	GAYNUTDINOV E.N.	MYRSAITOV M.F	T.D.HAI	B.T.HAN
REV.	DES.	DATE	CHECKED	DEPART. MANAGER	ENG. MANAGER	PRO. MANAGER

1 INTRODUCTION

The Beluga Oil Field is located at Block 09-3/12 in South-Eastern Offshore Vietnam with water depth about 61m from MSL. The distance from Beluga Oil Field to Vung Tau City is approximately 160 km. In the first phase of field development, one (01) wellhead platform was built, named CTC1 WHP, and put into production in January 2019. CTC1 WHP is connected to the Hub Platforms (RP2, GTC1) located at Block 09-1, via subsea pipelines and cables.

In the second phase of field development, it is tentative to build an additional Wellhead Platform CTC2 to produce oil & gas from the additional 09 wells drilled around the location of CTC1 WHP. The water injection is considered at the end of year 2023 with switching 03 production wells into injection well, and switching additional other 01 production well into injection well in the year 2024.

Based on the criterion of the need for the production and maximize the return on investment, CTC2 WHP will be considered to have the minimum facilities, connect to CTC1 WHP by a bridge. The full well stream of CTC2 WHP will be gathered together with the produced fluid of CTC1 WHP, processed in CTC1 WHP and then sent to the Hub Platforms (RP2, GTC1).

Location of CTC1 WHP, CTC2 WHP and related platforms is shown in the figure 1 as below.

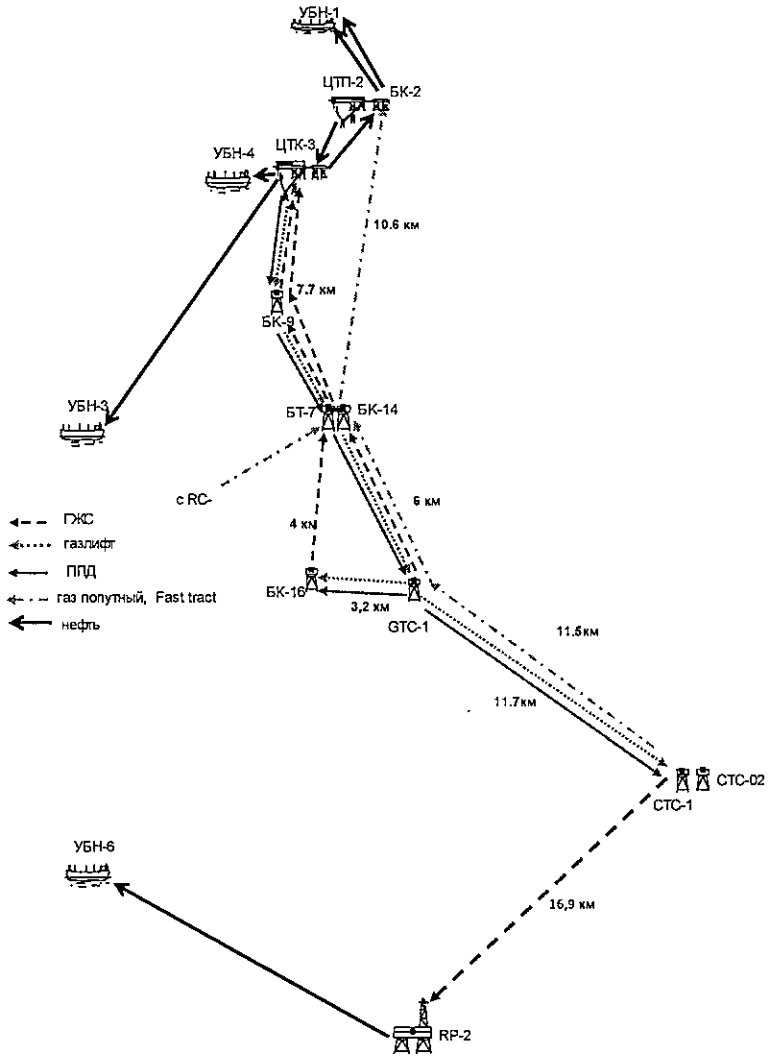

Fig. 1 – Location of CTC2 WHP

2 ADDENDUM

This document uses the Typical Engineering Documentation for this Project. However, some design intends or requirements may require to be revised to fit with Project's purpose. This section lists changes in the applied typical documents, originating in Typical Engineering Documentation for any reason including those indicated in Table 1. These changes are identified in this Addendum to the applied typical document, identifying the document and section affected and the required change.

VENDOR shall review the required changes in conjunction with the referenced document and project's engineering documents.

The type of modification shall be defined and indicated in subsequent text as follows:

- "ADD" - Indicates the following statement(s) is/are added to the Company referenced text.
- "DELETE" - Indicates the following statement(s) is/are deleted from the Company referenced text.
- "REPLACE WITH" - Indicates the following statement(s) is/are revision(s) to the Company referenced text.

Table – 1: List of changes

Section	Current Statement or Requirement	Revised to
Reference Documents	VSP-NIPI-TYP-TS-TP1-SP-01 Piping Material Class Specification VSP-NIPI-TYP-TS-TP1-SP-02 Specification for Manual Valves VSP-NIPI-TYP-TS-IA2-SP-04 Specification for Shutdown, Blowdown Valve and Hand Valve with Limit Switch	REPLACE WITH: CTC1.CTC2-002-GE-PI1-SP-001 Piping Material Class Specification; CTC1.CTC2-002-GE-PI1-SP-002 Specification For Manual Valves CTC1.CTC2-002-GE-IA2-SP-004 Specification for Shutdown, Blowdown Valve and Hand Valve with Limit Switch
Whole document	mini BK /Unmanned WHP/WHP	REPLACE WITH: CTC2
	Host Platform	REPLACE WITH: CTC1
6 Valve	Materials of construction of the valve shall be in accordance with, or better than those specified in the "VSP-NIPI-TYP-TS-TP1-SP-02_Specification for Manual Valves".	REPLACE WITH: Materials of construction of the valve shall be in accordance with, or better than those specified in the " CTC1.CTC2-002-GE-PI1-SP-02_Specification for Manual Valves".
6 Valve	Globe valves shall have bodies of cast or forged carbon steel to ASTM A216 Gr WCB or A105 respectively, with SS316 trim or other suitable materials which comply with the Automated Valve datasheet and the requirements of "VSP-NIPI-TYP-TS-TP1-SP-02_Specification for Manual Valves".	REPLACE WITH: Globe valves shall have bodies of cast or forged carbon steel to ASTM A216 Gr WCB or A105 respectively, with SS316 trim or other suitable materials which comply with the Automated Valve datasheet and the requirements of " CTC1.CTC2-002-GE-PI1-SP-02_Specification for Manual Valves".

RESEARCH AND ENGINEERING INSTITUTE FOR OFFSHORE OIL AND GAS

VIETSOVPETRO

AGREED BY
Deputy General Director of Vietsovpetro

Tran Xuan Hoang

16/03/2019

APPROVED BY
Chief Engineer of Vietsovpetro

Tran Van Vinh

17/03/2019

TYPICAL ENGINEERING DOCUMENTATION

DOCUMENT TITLE SPECIFICATION FOR CONTROL VALVE

DOCUMENT NO. : **VSP-NIPI-TYP-TS-IA2-SP-05**

AGREED:	Name	Date
Capital Construction Department		16/3/20
Material and Equipment Department		03/3/20
Mechanical Electrical Division		13.2.20

CONTROLLED

REV.	DES.	DATE	PREPARED	CHECKED	DEPART. MANAGER	ENG. MANAGER	PRO. MANAGER
0	IFA	25/10/2019	N.H.CHUNG	N.H.CHUNG	G.E.N	T.D.HAI	B.T.HAN

CHANGE LOG

REV.	SECTION	PAGE	CHANGE DESCRIPTION

REFERENCE DOCUMENTS

Number of document	Description
VSP-NIPI-TYP-TS-TP1-SP-01	Piping Material Class Specification
VSP-NIPI-TYP-TS-TP1-SP-02	Specification for Manual Valves
VSP-NIPI-TYP-TS-IA2-SP-04	Specification for Shutdown, Blowdown Valve and Hand Valve with Limit Switch

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1. INTRODUCTION

The typical engineering documentation is a set of engineering documents issued by Research and Engineering Institute (REI) that can be applied repeatly to many projects that REI involves.

The typical engineering documentation shall be agreed by related departments in Vietsovpetro and approved by Vietsovpetro, if any.

1.1 Purpose of document

This document defines the minimum requirements for design, materials, fabrication, inspection, testing, painting, preparation for shipment, and documentation for the supply of Control Valves.

1.2 Definition of Terms

Within this document the following definitions shall apply:

COMPANY	The party which initiates the project and ultimately pays for its design and construction and owns the facilities. Here the COMPANY is Vietsovpetro JV (referred to as VSP).
CONTRACTOR	The party which carries out all or part of the design, engineering, procurement, construction and commissioning of the project.
VENDOR	The party which the order or contract of supply of the equipment/package or services is placed.
Shall	Refers to mandatory requirement
Should	Refers to a recommendation

1.3 Abbreviations

FAT	Factory Acceptance Test
FC	Fail Close
FL	Fail Lock
FO	Fail Open
HC	Hydrocarbon
HSE	Health, Safety, and Environment
IOM	Installation, Operation, and Maintenance
ITP	Inspection and Test Plan
MTTR	Mean Time to Repair
NDE	Non Destructive Examination
NPS	Nominal Pipe Size
OS&Y	Outside Screw and Yoke
P&ID	Piping and Instrument Diagram
PCB	Polychlorobiphenyls
PVC	Polyvinylchloride
PO	Purchase Order
QA/QC	Quality Assurance / Quality Control
RF	Raised Face

RTJ	Ring Type Joint
SPIR	Spare Parts and Interchange ability Record
TPI	Third Party Inspection
VDRL	Vendor Data Requirements List
VSP	Joint Venture "Vietsovpetro"

2. REFERENCES, CODES & STANDARDS

2.1 General

All equipment supplied under this Specification and its appendices shall comply with the requirements of the National and International Codes, Standards and Regulations listed below and requirements of local statutory authorities in Vietnam that have legal jurisdiction over the sites at which the equipment will be installed. All equipment shall comply with the latest published version of the applicable codes, standards and regulations.

Any conflicting requirements shall be brought to the attention of the PURCHASER in writing.

Unless otherwise specifically informed by the PURCHASER, the most stringent requirement shall govern.

2.2 International Codes & Standards

Number of code or standard	Description
ASME B1.20	Pipe Threads
ASME B16.5	Pipe Flanges and Flanged Fittings
ASME B16.10	Face-to-Face and End-to-End Dimensions of Valves
ASME B16.25	Butt-welding Ends
ASME B16.34	Valve - Flanged, Threaded, and Welding End
ASME B16.47	Large Diameter Steel Flanges
ASME B31.3	Process Piping
ASME B31.4	Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
ASME BPVC, Sec. V	Non-destructive Examination
ASME BPVC, Sec. IX	Welding and Brazing Qualifications
ASTM A-48	Gray Iron Castings
ASTM A-193	Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A-194	Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A-216	Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service
ASTM A217	Standard Specification for Steel Castings, Martensitic Stainless and Alloy, for Pressure-Containing Parts, Suitable for High- Temperature Service
ASTM A352	Standard Specification for Steel Castings, Ferritin and Martensitic, for Pressure-Containing Parts, Suitable for Low-Temperature Service
ASTM E-94	Guide for Radiographic Examination
ASTM E-709	Magnetic Particle Testing
ASTM B117	Corrosion Resistance Criteria

Number of code or standard	Description
ASTM E-142	Controlling Quality of Radiographic Testing
ASTM E446	Standard Reference Radiographs for Steel Castings Up to 2 in. in Thickness
API-RP-505	Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2.
API-RP-540	Electrical Installation in Petroleum Processing Plant
API-RP-598	Valve Inspection and Testing
API-RP-6FA	Specification for Fire Test for Valves
API-RP-6D	Specification for Pipeline Valves (Gate, Ball, and Check Valve)
API-RP-607	Fire Test for Soft Seated Quarter Turn Valve
API 1104	Welding of Pipeline and Related Facilities
FCI-70.2	Control Valve Seat Leakage
IEC 60534	Industrial-process control valves
ISA S75.01	Control valve sizing equations
ISA S75.03/16	Face-to-Face Dimensions For Flanged Globe-Style Control Valve Bodies
ISA S75.08	Control Valve Face-to-Face Dimensions
MSS SP-53	Quality Standard for Steel Castings and Forgings for Valves, Flanges and Fittings and Other Piping Components-Magnetic Particle Exam Method
MSS SP-54	Quality Standard for Steel Castings for Valves, Flanges and Fittings and Other Piping Components – Radiographic Examination Method
MSS SP-55	Quality Standard for Steel Castings for Valves, Flanges and Fittings and Other Piping Components - Visual Method for Evaluation of Surface Irregularities
MSS SP-101	Part-Turn Valve Actuator Attachment - Flange & Driving Component Dimensions & Performance Characteristics
SNT-TC-1A	Personnel Qualification and Certification in Non-Destructive Testing
ISO 5210	Quality Standard for Steel Castings and Forgings for Valves, Flanges and Fittings and Other Piping Components-Magnetic Particle Exam Method
AWS D 1.1	Quality Standard for Steel Castings for Valves, Flanges and Fittings and Other Piping Components – Radiographic Examination Method
EN 10204: 2004	Quality Standard for Steel Castings for Valves, Flanges and Fittings and Other Piping Components - Visual Method for Evaluation of Surface Irregularities
ISO 5211	Part-Turn Valve Actuator Attachment - Flange & Driving Component Dimensions & Performance Characteristics
ISO 10474	Steel and steel products - Inspection documents
ISO 17292:2004	Metal Ball Valves for petroleum, petrochemical and allied industries
PED 97/23/EC	Pressure Containment Vessels
VDINDE 3845	Auxiliary Equipment Attachments

3. ENGINEERING DESIGN DATA

3.1 Environmental conditions

All Instrument and Control equipment shall be suitable for operation on offshore platform. The equipment shall be suitable for continuous and short time duty, in the environmental conditions prevailing at site.

The environmental and climatic data are summarized below:

Atmosphere:	Offshore, salt laden, marine air condition, expose to monsoon storm and winter depression
Ambient Temperature:	39°C (Max) 21°C (Min)
Relative Humidity:	98% (max) 62% (min)
Wind Velocity:	18.8 m/s
Rainfall:	50 mm/hr
Seismic:	5 Richter

3.2 Design Life

All new equipment shall be designed for a service life of 15 years and shall have minimum 2 years proven in used in offshore environment condition.

3.3 Utilities

3.3.1 Instrument Air

The facilities will be equipped instrument air system which shall meet requirements of ISA-7.0.01 "Quality Standard for Instrument Air" in general as followed.

The instrument air shall be free from oil and other liquids, and from toxic, corrosive, flammable and obnoxious gases or vapors.

The pressure dew point as measured at the dryer outlet shall be at least 10°C below the minimum temperature to which any part of the instrument air system is exposed. The pressure dew point shall not exceed 4°C at line pressure.

The quantity of solids shall be less than 0.1 g/m3 and the diameter of the particles shall not be more than 40 micrometer particle size in the instrument air system is acceptable for a majority of pneumatic devices.

The lubricant content should be as close to zero as possible and under no circumstances shall it exceed one ppm w/w or v/v.

- Design Instrument Air pressure : 12 barg
- Normal Instrument Air pressure : 5~7 barg
- Max./ Min. Instrument Air pressure : 8 / 4 barg

3.3.2 Electrical Power

Power supply to Instrument and Control systems shall be as follows:

- 230 VAC, 50 Hz, 1-phase, unearthed, UPS
- 230 VAC, 50 Hz, 1-phase, Non-UPS, solidly earthed
- 400 VAC, 50 Hz, 3-phase

24 VDC power supplies, if required, shall be derived from the respective power supply unit within the systems.

Note 1: For UPS backup time definition, reference shall be made to Electrical Basis of Design.

3.4 Units of Measurement

Unless otherwise stated, units of measurement shall in general be in accordance with the International System of Units (SI Units), ISO 80000-1.

3.5 Weather Protection

3.5.1 Ingress Protection

Ingress protection for instruments / equipment shall be in accordance with IEC 60529 and as follows:

- Minimum IP 56 for outdoor installations
- Minimum IP 44 for installations inside enclosed rooms without air-conditioner
- Minimum IP 22 for installations inside enclosed rooms with air-conditioner

3.5.2 Tropicalization

All field mounted electrical/electronic instruments/equipment shall be tropicalized in accordance with manufacturer's standard procedure. All electronic printed circuit boards shall be conformal coated or equal, to protect against humidity, corrosion and heat (i.e. tropical ambience).

3.6 Hazardous Area Classification

Hazardous areas shall be classified according to API RP 505, and equipment specified accordingly.

All equipment for use in hazardous areas shall be certified by reputable bodies such as ATEX, PTB, CENELEC, BASEEFA, FM, UL, CSA...

Sensors and actuating devices outside rooms shall be certified for operation in a Class 1, Zone 2 Group IIA T3 hazardous area as minimum. Unless otherwise stated, the minimum ingress protection of outdoor instruments and devices shall be IP56 as minimum as per DNVGL-D201 and IEC 60529.

For reasons of standardization, unless otherwise stated, all field mounted electrical equipment used for instrumentation circuits shall utilize the methods of EEx'd' protection and be certified for the hazardous area. Two following cases should be considered:

- Junction boxes for Non-Intrinsically Safe Circuits–Explosion proof/flameproof Ex 'e' if comply with API RP14F, otherwise Ex'd' shall be required
- Cable Gland – Explosion proof/flameproof Ex 'd'.

If specialist instrumentation cannot be provided with the above methods of protection, then alternative methods suitable for the classified area and certified by an acceptable Authority may be proposed The Vendor shall submit a technical report justifying the instrument selection for the Purchaser's consideration.

Cables that necessarily are located so they may come into contact with mud are to be constructed of materials resistant to oil based mud to comply with DNVGL-D201.

The Vendor shall provide a dossier of all hazardous area equipment, containing all information pertinent to the hazardous area work. The dossier shall include all necessary certificates, drawings, calculations, catalogue information, data and specification sheets etc.

All instrument equipment to be installed in a hazardous area meets all the relevant requirements of the ATEX Directive (94/9/EC) and shall have the CE symbol clearly fixed to indicate compliance.

If they meet other requirement of UL, CSA (North America)..., the UL ; CSA or relevant symbols shall be provided to indicate compliance.

3.7 Earthing

There are 2 type of earth in platform:

- Instrument Earth: Instrument termination; earth bar... shall be connected to.
- Protective Earth: Instrument housing, enclosure shall be connected to.

All panels, junction boxes, frames, etc. shall be equipped with 10 mm diameter earth studs and all metal work shall be earth bonded. All outdoor equipment shall have external earth studs.

All Instrument signal cable screens shall be earthed at one point only. This shall be at the equipment panels. All screens shall be continued through junction boxes and insulated from earth at the field side.

Cable armors shall be earthed at both ends with continuity through junction boxes.

All electronics field instrument housings shall be separately grounded by connecting the external studs to the platform ground.

For Offshore all the earth points converge to a single earthing boss, however the safety and Instrument earths will remain segregated at the enclosure end.

Earthing cables used shall be stranded Cu and EPR insulated, 600/1000 Volt grade and shall have green / yellow colored outer sheaths.

Internal package earthing shall be fully wired by Vendor c/w earthing cables, earthing boss, earth bar... shall be supplied by Vendor. Vendor shall submit Earthing schematic and wiring document/drawing for Company's review and approve. Package's earthing system shall be complied with DNVGL-D201 requirement.

3.8 Nameplates

Each item shall be equipped with a manufacturer's nameplate of 316SS permanently attached with stainless steel screws or rivets indicating the specified data referred to under the particular Instrument Specification in addition to the following as a minimum:

- Instrument Tag No.
- Purchase Order No.
- Name of Manufacturer.
- Place of Manufacture.
- Type and Model No. (including reference to any special features).
- Serial No.

All information displayed on nameplates shall be in the English Language, in Metric units, and approved by the Purchaser.

The Vendor shall install an engraved traffolyte label (black on white), screwed to the instrument mounting, stating the instrument tag number.

4. SCOPE OF SUPPLY

The Vendor shall be responsible for the design, manufacture, testing and supply of control valves in accordance with this Specification and associated Project Data Sheets.

The Vendor is further responsible for the sizing of the control valves and for the supply of appropriate calculations and documentation as specified.

The Vendor shall ensure that workmanship, materials and quality control are to the highest standards for all delivered equipment and that only proven techniques and design are utilized.

The Vendor shall confirm that they are able to fully support the testing and servicing of the control valves and to offer specialist assistance where appropriate.

Each control valve shall consist of a complete factory assembled unit. The unit shall be suitable for the duty as detailed on the appropriate Project Data Sheet, fully tested and ready for installation.

Each unit shall be complete with, but not limited to the following equipment and requirements:

- Control Valve
- Tagging

- Packaging and marking for transport
- Inspection and Testing
- Documentation, drawings and certification
- Start up and Commissioning Spare Parts
- Protective Coating
- Special Tools

4.1 Conditions of Service

The control valve shall be suitable for the defined process conditions and for use on the offshore platform, marine environment, platform located in Vietnam Oil Field.

4.2 Vendor Exceptions

The Vendor shall be responsible to submit, together with the Tender, a list of deviations or exceptions to this Specification. In the absence of any exceptions, it will be construed that the Vendor fully complies with this Specification.

4.3 Vendor Standard Equipment

The Vendor may offer standard equipment, which is suitable for the specified design, service and environmental conditions, where commercial or technical benefits may be justified. In such cases the Vendor shall provide a user list demonstrating significant, reliable operating experience for the equipment offered, under similar service conditions. The vendor shall also identify all exceptions to the specification.

5. GENERAL REQUIREMENT

5.1 Materials Selection & Corrosion Control

All materials shall be as detailed in this Specification, Data Sheets and referenced specifications. When materials are not specified the Vendor may offer their standard material suitable for service and operating/design conditions in a coastal marine salt laden environment.

It is not the intention of this specification to exclude the substitution of other materials of equal or superior quality. However, the Vendor must obtain written approval from the Purchaser before proceeding with substitution and / or fabrication.

Care shall be taken in the selection of materials used within the valve/actuator/accessories assemblies to minimize corrosion induced by process conditions, environmental conditions and combinations of dissimilar metals.

All items on the valve/actuator/accessories assembly that are exposed to the environment shall be of a non-corroding material.

Type 304 stainless steel and similar non molybdenum austenitic stainless steels (e.g. 302, 303) are not acceptable due to chloride sensitivity.

Cadmium plating or galvanizing shall not be used for any component of the shutdown, blowdown and hand valves or accessories.

All materials shall be new and unused, of current manufacturer and free from defect.

Aluminum shall not be used for any part of the equipment that may come into contact with the process fluid. The use of Aluminum in any component shall be subject to approval by the Purchaser.

Bolting shall be of like material to the equipment supplied. All bolting materials in pressurized service shall be in accordance with "VSP-NIPI-TYP-TS-TP1-SP-01_Piping Material Class Specification".

All materials (including gaskets and sealants) shall be free from the following hazardous substances:

- Asbestos
- Ceramic Fibre
- Chlorofluorocarbons
- Polychlorobiphenyls (PCB) and their isomers
- Radioactive Materials
- Mercury

5.2 Material Traceability and Certification

All materials used shall have full chemical analysis and mechanical test certification and shall be identifiable by means of certified markings relating to the available authentic material certificates. Material certification requirements shall be in accordance with Materials in Manufacture" and EN 10204, "Metallic Products – Types of Inspection documents" 3.1C certification shall be supplied in hydrocarbon and other hazardous services and 3.1B in other services for wetted and pressure retaining components.

All chemical analyses shall be certified by product check analysis with the exception of Carbon Steel (Non-NACE) and Bronze for which ladle analysis will be acceptable. Certification for bolting shall be to Standard Designation 3.1B unless stated otherwise. Where supplementary requirements or impact testing in excess of the product specification are specified, the Vendor shall provide certification proving that bolting meets the specified requirements. The Vendor shall keep available manufacturers reports etc., for examination by the Purchaser or their representative, for a minimum period of five years. Minor components for which the materials are not specifically designated shall have physical and chemical properties consistent with that of the major components.

Materials for use in cold service (0°C and below), alloy steel materials, and materials 6 mm thick or less shall not be hard stamped or pop marked. All markings shall be by vibro-etching or by Purchaser approved paint.

Where the equipment operates in a corrosive service (e.g. carbon dioxide dissolved in 'wet' hydrocarbon gas) all process wetted materials shall be suitable for corrosive service. Corrosive components in the process fluid and the requirement for NACE certification, is indicated on the Data Sheets if required.

5.3 Weight Control

The Vendor shall exercise an active weight control system throughout the design and fabrication of the Equipment. The Vendor shall submit an Equipment Weight Data Sheet with weight and center of gravity information.

5.4 Transportation Loads

If required, the Vendor shall provide transportation supports for loading and transporting the assembled and completed packages from Vendor's works by either road and/or sea.

5.5 Hazardous Area Rating

All equipment shall be suitable for the degree of Hazardous Area and Ingress Protection rating as specified on Automated Valve datasheet. Unless otherwise stated on the Data Sheets, the hazardous area shall be considered Class 1, Zone 2, Group IIA, temperature classT3, hazardous area as defined by the API RP 505. The preferred protection of instrumentation parts in hazardous area is Ex'd' type.

The valves will typically be installed in hydrocarbon service, and the resulting hazardous area classification in their vicinity is indicated on the Automated Valve datasheet.

The Vendor shall ensure that all instrument equipment to be installed in a hazardous area meets all the relevant requirements of the NEC or NEMA standard and have the FM symbol clearly fixed to indicate compliance.

In addition, all equipment and protective systems must be marked legibly and indelibly with the following minimum particulars:

- Name and Address of the Manufacturer
- Designation of Series or Type
- Serial Number
- Year of Construction
- All information essential to their safe use

5.6 Protective Coatings

All equipment shall be suitable for operation in the environment referenced in this specification.

Corrosion resistant materials such as SS316L shall not be painted, unless covered by thermal insulation, in which case the material shall be painted.

The valves of this project shall be cleaned and applied with protection coatings in accordance with project painting documents:

Full technical data of the proposed paint manufacturers' products is to be provided by the Vendor with his Tender.

5.7 Certifying Authority

The Purchaser shall ensure that all applicable technical, documentation or inspection requirements specified by the Certifying Authority are included in this Specification or associated Data Sheets.

6. TECHNICAL REQUIREMENTS

6.1 General

As standardized in IEC 60534, control valve data sheets must indicate valve capacity (in terms of Cv), material for body, trim, packing etc. However, this does not absolve the vendor of the responsibility for proper selection with respect to the following:

- Valve with suitable capacity (in terms of Cv) and range ability for the flow conditions indicated.
- Actuator to meet the shut-off differential pressures indicated.
- Materials for body, trim, packing box and other ports of the valve for the fluid and its operating conditions indicated.
- Materials used for various ports of all accessories of the control valve like air filter regulators, positioners, pilot relays, volume boosters, locking relays, interconnecting tubing fittings, solenoid valves and limit switches (if any), etc.
- Checking and proper treatment for cavitation, flashing and noise and ensuring that the body velocity is within the permissible limits.

6.2 Valve

Materials of construction of the valve shall be in accordance with, or better than those specified in the "VSP-NIPI-TYP-TS-TP1-SP-02_Specification for Manual Valves". Where suitable, the Vendor may offer their standard valve trim materials.

Where required to achieve tight shut-off, the Vendor may propose alternative seat materials capable of meeting the specified design pressures and temperatures.

Globe valves shall have bodies of cast or forged carbon steel to ASTM A216 Gr WCB or A105 respectively, with SS316 trim or other suitable materials which comply with the Automated Valve datasheet and the requirements of "VSP-NIPI-TYP-TS-TP1-SP-02_Specification for Manual Valves".

Aluminum shall not be used for any part of the equipment that may come into contact with the process fluid.

When hardened seats (such as stellite seats) are specified, the base material shall be at least as corrosion and erosion resistant as the material specified for these parts unless the hard material covers the entire surface exposed to the corrosive or erosive action of the medium.

Whenever stelliting of trim has been specified, it stands for stelliting of the complete plug, seat joint and orifice unless otherwise mentioned.

Hardened seats shall be supplied for valves in flashing or cavitation service.

6.3 Accessories

Except where specified otherwise, 316L Stainless Steel shall be used as the principal material of construction for control accessories (wetted and non-wetted parts) including all brackets, mounting plates and nuts and bolts. Other grades of non-molybdenum austenitic stainless steel e.g. 302, 303, 304, 305 are forbidden.

Fabricated or cast steel suitably painted in accordance with project painting specifications may also be considered but shall be subject to approval by the Purchaser.

Aluminum or Zinc based alloys shall not be used as a construction material unless authorized in writing by the Purchaser.

As a minimum, tubing shall be seamless 316 SS to ASTM A269 with a minimum Molybdenum content of 2-3%. Tubing shall be supplied in the solution annealed condition.

Compression fittings shall be 316 SS as a minimum. Substitutes will not be accepted and shall be replaced at no cost to Purchaser.

6.4 Valve selection

The Vendor shall verify the selection of the Control valve size, type and material for each application in accordance with the information furnished to determine the most suitable valve for each application. This shall include evaluating each application for cavitation and/or flashing conditions and noise levels.

The control valve capacities in terms of Cv shown in the purchaser's data sheets have been arrived at using the formula given in the standard ISA S75.01 – "Control valve sizing equations". Calculations shall be submitted to the Purchaser recording the minimum, normal and maximum flow coefficients (Cv), as appropriate for the operating fluid and operating cases and shall record the maximum possible flow through the control valve with the selected flow coefficient.

The sizing calculation report shall be provided by Control Valve Manufacture and included in Proposal.

Noise calculations shall also be submitted showing maximum noise levels for each operating case.

Valve characteristics shall be as specified on the data sheets.

Control valve shall be selected such that its capacity is between 120% and 140% of design for linear trims and 130 to 160% for equal percentage trims.

Control valves shall be designed to operate within 20 - 80% of their stroke if not stated otherwise in Automated Valve datasheet. Where this is not achievable, 10%-90% of stem opening (travel) can be acceptable or two valves in parallel may be used.

In general, control valves shall be sized so that the valve opening is at noted below:

- At maximum flow; about 80% open
- At normal flow; about 50%-75% open
- At minimum flow; about 20% open

The effect of any reduced inlet and outlet pipe sizes and valve pressure recovery shall be taken into account when sizing control valves.

6.5 Valve Design

The vendor shall furnish the Construction/General Arrangement drawings of each style of valve. The drawing shall clearly indicate and identify each component.

Ancillary equipment such as solenoids if required shall be fitted with permanently affixed stainless steel labels with tag numbers engraved in accordance with the Control Valve Data Sheets.

6.5.1 General Features

Globe valves should be flanged to ASME B16.5 (inch dimensions), the flange finish shall be between 3.2 and 6.3 µm.

Designs utilizing RTJ ends are required on Class 900 and above.

Valve bodies with flanged ends shall have pressure-temperature ratings to ASME B16.34 as a minimum.

Welded ends on butt-weld valves shall conform to ASME B16.25, beveled on each end, and unless specified, shall be bored to match the schedule / size of the pipe specified.

Butt welds joining valve bodies to hubs or flanges shall be fabricated in strict accordance with ASME B31.3. Acceptance criteria shall be as per ASME B31.3.

Butt-weld end valves shall be provided with pup pieces.

The direction of flow through a valve shall be permanently marked on the body or flanges.

Flow Direction:

Unless otherwise mentioned, flow direction shall be as below:

- Flow tending to open for single seated valves.
- Flow entering between the seats for double seated valves.

End Connections:

Unless otherwise mentioned, end connection details shall be as below:

- Threaded end connections shall be to NPT as per ANSI B1.20.1
- Flanged end connections shall be as per ANSI B16.5
- Flanged face finish be serrated concentric to paragraphs 6.4.5 of ANSI B16.5.
- Ring type joint flanges shall have octagonal grooves as per ANSI B16. 20.
- Face-to-face dimensions of globe type control valves shall be in accordance with ISA S75.08.

Where provided, bottom drains shall be plugged off or blind flanged. Where a plug it used, threads shall correspond to ANSI B1.20.1. Where a flange is used, its dimensions and rating shall correspond to ANSI B 16.5.

Control valves with soft seats (such as PTFE) shall only be employed where the specified degree of tight shut off cannot be achieved using metal seats.

An arrow indicating the correct direction of flow shall be an integral part of the valve body.

Valves to be marked in accordance with section 6.

All castings shall be true to form, free from shrinkage, strains, scale, lumps, blisters, sand holes or other defects. All machining operations shall be performed so that, all parts of valves of the same size, type and pressure rating are interchangeable.

6.5.2 Trim

Where trim is referred to in the data sheets, it shall include the inner valve seat rings, plug stem, guide, bushing, cage and plug, disc or ball as applicable to the valve type. The Vendor is to determine guide bush material.

If a reduced trim valve is specified, the diameter of the seat ring opening shall be reduced. The body shall be capable of having full size trim installed unless specifically noted elsewhere.

Reductions in trim size shall normally be to 40% trim but shall not be more than two port sizes, except where body size is only 1 inch NPS.

If the valve stem and plug are not integral, the stem shall be threaded and pinned to the inner valve. The sizes of the stem, pin and pinhole shall be such that the torque and force developed by the inner valve will be transmitted to the actuator through the stem without deforming or buckling it.

For severe service applications, integral plug and stem or equivalent is preferred.

Balanced valve designs shall be used wherever possible in services where blockage of ports is not a factor in order to minimize the size of actuator required.

Multistage trims shall have a minimum hole size of 3mm to minimize the chances of blockage.

The valve stem connection to the actuator stem shall be adjustable, with positive locking of the adjustment.

The valve stem, guides and guide bushings shall be polished.

Single seated globe and angle type control valves shall have heavy top guiding. Double seated valves shall have top and bottom or cage guiding and shall be of the pressure balanced type. Whenever cage type control valves are specified, double seated control valves can be accepted. But whenever double seated control valves are specified, cage type control valves shall not be accepted. Guide bushings shall be of a sufficiently hard material to resist tide thrust on the plug.

The acceptable degree of seat leakage shall be specified for each valve, using the six classes defined in ANSI/FCI-70.2 and shall be indicated on the Control Valve Data Sheets.

Control valves shall have seat leakage Class IV unless specified otherwise.

Control valves in discharge lines to flare shall have bubble tight shut-off.

6.5.3 Bonnet

Valve body bonnets shall be of similar material to the body and shall be flange bolted to or integral with the body. Screwed bonnets shall not be provided.

For valves in "lethal service" as specified on the Automated Valve datasheet the requirements of ASME B31.3 Chapter VIII shall be met.

Extension bonnets shall be furnished on valves that operate or are subject to occasional operation in cold (below 0°C) service. Wherever the operating temperature of the fluid is above 200 °C, on extension or radiation finned bonnet shall be provided.

Bellows seal bonnets shall generally be avoided but may be offered when required to meet stem leakage requirements for valves in lethal service. Where fitted, they shall be provided with a monitor for bellows leakage e.g. pressure gauge and excess flow valve. If bellows seals are required they shall be constructed form 316SS.

6.5.4 Stem Packing

Each valve shall be provided with a bolted gland type or spring tension type with a low fugitive emission stuffing box. Fugitive Emissions shall comply with the requirements of section 1.9.

Packing material type will depend on the service conditions. The preferred packing material for services from -200°C to 200°C is PTFE (Teflon). Flexible graphite packing that has temperature limits from -200°C to 450°C shall be used for temperatures above 200°C. The Vendor shall, in all cases, propose packing materials appropriate to the service conditions indicated on the data sheet.

All valves requiring packing lubrication shall be fitted with a grease lubricator, isolating valve and lantern ring.

Vendor shall specify the lubricator stick material used in each case

6.5.5 Gasket

Valve body gaskets are to be retained in a full captive joint.

The Vendor is to furnish its standard gasket material compatible with process fluid and operating conditions, unless otherwise specified.

6.6 Actuation

6.6.1 Actuator Selection

Spring return actuators are the preferred type of actuator for the operation of control valves.

The spring shall be capable of supplying 100% of the required actuator force.

Reverse-acting spring diaphragm actuators incorporating seals or glands shall be avoided.

6.6.2 Actuator Sizing

The Vendor shall determine actuator size and force / torque output requirements based upon the operating conditions and leakage classification specified in the Automated Valve datasheet to ensure correct operation of the valve.

The valve Vendor's recommended figures for actuator sizing (including adjustments for specific operating conditions) shall be used to determine the specific actuator size and model required. Where there is conflict between the Vendor's recommended figures and criteria specified here, the more onerous criteria shall be selected.

If maximum valve ΔP at shutoff is shown, the actuator shall be sized for this pressure plus any additional thrust required to ensure that maximum leakage specified is not exceeded. If maximum ΔP at shutoff is not specified, actuators shall be sized for a ΔP equal to the maximum operating pressure specified, plus 20%.

For pneumatic diaphragm actuators the normal actuator operating range should be 0.2 to 1 barg or 0.4 to 2 barg, but shall not exceed 4.2 barg. For piston actuators, the actuator shall be sized on the basis of the minimum design pressure of the utility supply.

Pneumatic actuators shall be designed for air supplies as shown in section 3.3. The actuator shall be capable of operating down to the low design pressure. All pressure containing parts of the actuator and positioner shall be designed to safely withstand the maximum design pressure of the actuating medium. Protection by PSV shall not normally be acceptable and shall be subject to approval by the purchaser on a case by case basis.

Valve fail action shall be achieved by spring action only, without the use of local accumulators.

For flow-tending-to-close valves the actuator shall be capable of opening the valve against the full upstream pressure and for flow-tending-to-open valves the actuator shall be capable of closing the valve against the full upstream pressure.

6.6.3 Actuator Design

High grade carbon steel shall be used for all pressure retaining parts of the actuator.

No cast iron, malleable iron, Aluminum, plastic or copper bearing alloys shall be used for any components without prior approval by the Purchaser.

The Vendor shall identify all material used in the construction of the actuator.

All welding (including casting repair) shall be performed in accordance with written procedures and by ASME IX code qualified welders.

The design of the actuator shall ensure that the action of the control valve on failure of the control signal or operating medium shall be to a predetermined safe position.

Valve actuator safety margins shall be carefully considered. The torque available from the actuator at any point in the stroke shall be a minimum of 1.25 times.

Start & end torque of actuator shall be 1.25 times greater than breakout torque of valve.

Maximum torque by the actuator shall be less than the maximum allowable stem torque of the valve.

Actuator shall be pneumatically operated. Actuator casing shall be made of pressed steel. In general, spring, opposed diaphragms type actuators are preferred. Only when this type of actuator becomes extremely unwieldy, should a piston and cylinder type of actuator be considered. Electric actuators may be used where so specified.

Springs shall be corrosion resistant, cadmium or nickel plated and fully enclosed in a suitable housing and stamped or color-coded for identification of characteristics.

Their compression should be adjustable. In general, an actuator operating range of 0.2 to 1 barg is preferred

All control valves shall be provided with a travel indicator and scale to show the position of the valve, whether under the action of the control signal or hand wheel. Scales shall be calibrated from 0-100% in steps of 10%.

Diaphragm actuators shall be operated using positioners unless indicated otherwise on the Control Valve Data Sheet.

Detachable side mounted heavy-duty hand wheels shall be provided where specified.

Actuator action shall be field reversible. Diaphragm actuators shall be multiple bolted, pressed steel with diaphragms compatible with the instrument gas supply, such as Viton or nylon reinforced neoprene. Buna N rubber shall not be used.

The actuator shall be capable of being rotated to change the location of the positioner or by other means.

'Bench setting' shall be avoided by the use of adequately sized actuators.

To ensure that complete valve / actuator assemblies are lifted by eyebolts on the valve body, lifting eye bolts on actuators are not permitted.

6.6.4 Positioner

A positioner shall be supplied on all valves unless indicated otherwise on the Project Datasheet.

The positioner shall be mounted on the valve and unless otherwise specified on the Control Valve Data Sheet, shall have the following features:

- Type: Electro-pneumatic, Smart DVC type positioner
- Bypass: Vendor to advise
- Gauges: Weather proof gauges scaled in barg with over pressure protection facility, required for Supply and Output air pressures.
- Positioner Output: Direct acting, with field reversible action

Intelligent "Smart" positioners shall have self-diagnostic and valve signature-monitoring features.

Positioners shall provide diagnostics information that shall include diagnostic tests, analyzed data of Seat Load, Bench set, valve friction, Hysteresis, Dynamic Error Band and Dynamic Linearity of the Control Valve, based on 0-100% of valve travel. An option to perform on-line diagnostics, while the valve is controlling the process, shall be included. Any enhancement of functionalities shall be possible from the software without any change in hardware. Positioners and electro-pneumatic converter shall have corrosion resistant linkages and rugged brackets. The electrical connections shall be M20 and Pneumatic connections shall be 1/2" (NPT) (F) to ANSI B 1.20.1. If they are different, suitable adapter should be provided.

The Positioner and accessories shall have adequate EMC protection and shall be tested to the required industrial standards.

The positioner shall have sufficient capacity for pressurizing and venting the actuator in order to maintain the response time specified on the Control Valve Data Sheets. If this is not possible then quick exhaust valves and / or booster relays shall be used also.

6.6.5 Positioner / Actuator Performance

The Vendor shall state for each control valve assembly:

- Maximum dead band (includes stiction, backlash and dead band). This shall not exceed 1% of the rated (full scale) input signal
- Speed of response including:
  - ✓ Dead time before any response is visible (Td)

- ✓ Time to reach 63% of travel response for a 10% step change in input signal (T63)
- ✓ Time to reach 98% of travel response for a 10% step change in input signal (T98)

- Hysteresis. The hysteresis shall not exceed 1% of the maximum valve stroke and shall be limited to 0.5% on critical services, such as compressor surge control. Critical service valves shall be identifiable by their high performance requirements such as rapid control action or tight control tolerance as indicated on the Control Valve Data Sheets.
- Positioner overshoot (% overshoot for a 10% change in input signal)
- Independent linearity. Shall be +/- 1% of output signal span maximum

6.7 Valve Accessories

6.7.1 General

Control valves shall be furnished complete with all accessories and equipment necessary to operate the valves as described in this specification and on the Control Valve Data Sheets.

All accessories shall be factory mounted on the valve/actuator, adjusted and calibrated in accordance with the Control Valve Data Sheets with all tubing connections complete.

Mounting of accessories shall not interfere with the operation of the control valve.

Accessories shall ensure the required actuator stroking times are achieved as specified on the Control Valve Data Sheets.

6.7.2 Electrical Characteristics

Electrical connections shall be made to the instruments via an M20 cable entry, or as indicated on the Control Valve Data Sheet. Instruments shall include an integral terminal box. Flying leads are not acceptable except for limit switches.

6.7.3 Filters / Regulators

All pneumatic control valves shall be fitted with in-line filters and pressure regulator to suit the specified utility supply.

Filter regulators shall be of the reducing type, made of 316SS material and come with relief, drainage facilities and bolt adjustment provided with locking facility to prevent tampering. The pneumatic connection shall be ½" NPT-F.

Filter / Regulators shall:

- Be Manufacturer / Model specified on the Control Valve Data Sheet
- Have set point as determined by the Vendor.
- Have 25-micron Filter Element
- Be fitted with a pressure gauge

6.7.4 Quick Exhaust Valves / Booster Relays

Quick exhaust valves and/or booster relays shall be provided where necessary to meet the required stroking times for the control valve as specified on the Control Valve Data Sheet.

6.7.5 Limit Stops

Where called for on the Control Valve Data Sheet, valves shall be supplied with adjustable limit stops.

Limit stops shall be mechanical devices mounted on the actuator, but they shall not form part of the hand wheel mechanism. The limit stops shall be adequately protected against unintentional adjustments.

6.7.6 Tubing and Fittings

Tubing and fittings shall be in accordance with section 6.3 of this specification.

Refer to "VSP-NIPI-TYP-TS-IA2-SP-03_General Instrument Specification" for more detailed requirement of tubing and fittings.

6.7.7 Tubing Installation

The Vendor shall pre-install instrument tubing between the valve/actuator components and the Purchaser's connection point for air/hydraulic supply.

Installation shall be in accordance with the fitting manufacturer's instructions. Personnel installing fittings shall have attended the manufacturers training course.

The number of joints in tubing runs shall be kept to a minimum.

All tubing shall be cut using tube cutters have straight edges and have burrs removed. Hack saws shall not be used.

All tubing shall be neat in appearance, round and be free from external scratches and defects.

Tube bends shall be used in preference to elbow fittings. The internal radius of tubing bends shall be as per the tube manufacturer's recommendations.

Tubing shall not be bent to a radius of less than the manufacturer's recommendations.

Tubing must be installed in a manner to allow ease of removal of components within each assembly. It must also be routed to avoid obstruction to both manual operations of solenoid valves and making of Purchaser connections in the field.

The Purchaser air/hydraulic connection shall be provided with a removable plastic plug for protection in transit and in the construction yard.

Vent tubes shall be fitted with bug screens.

Vent tubes shall be oriented to prevent air being blown in the direction of an operator.

7. QUALITY ASSURANCE, INSPECTION AND TESTING

7.1 Quality Assurance

The Vendor shall demonstrate that they operate a quality system in accordance with an internationally recognized standard such as ISO 9001. The effectiveness of the quality system and the Vendor's compliance with it shall be subject to monitoring by Purchaser and in addition, may be audited following an agreed period of notice.

The Vendor shall submit a quality control program for Purchaser review at the time of Tender. The Vendor shall provide facilities for and cooperate with Purchaser and Inspectors during manufacturing, assembly and testing.

7.2 Inspection

The Vendor shall be responsible for the planning and execution of all inspections and tests, but the Purchaser's representative shall have the right to witness any or all of the manufacturing activities, inspections or tests.

The Vendor shall submit an Inspection and Test Plan (ITP) for purchaser review and mark-up following purchase order placement. The ITP shall list all inspections and tests proposed for the equipment by the Vendor, between the date of ordering and the date of delivery.

The Purchaser and the Vendor shall sign off the final version of the ITP, which, thereafter, shall form part of the contract documents.

The word 'Hold Point' indicated in the ITP means that a written request shall be issued to the Purchaser and the Purchaser appointed representative, and work shall not proceed without the Purchaser's or the Purchaser appointed representative's attendance unless a written waiver is given by the Purchaser.

The Vendor shall provide 14 calendar days' written notification to the Purchaser of every 'Witness' or 'Hold' point identified on the ITP. Furthermore, the Vendor shall provide a 5 calendar day confirmation notice that the planned activity will proceed.

Vendor shall be notified of Purchaser's, Company's, and Purchaser appointed representative's intent to witness the inspection activity.

Inspection by the Purchaser shall not relieve the Vendor of any guarantees, responsibilities or obligations to furnish equipment / materials to this specification and the appropriate Project Data Sheets.

Any delays caused by late notification or late cancellation and subsequent re-testing shall be to the Vendor's account.

7.3 Testing

7.3.1 General

The Vendor shall devise and execute a test program during all stages of fabrication. Results of such testing shall be fully documented.

All stages of testing may be subject to witness and approval by the purchaser and / or a third party verifier as identified by the Purchaser / Verifier in the inspection and test plan.

The Vendor shall provide the Purchaser with at least 14 calendar days advance notice to witness tests performed in either the Vendor's shop or his sub-Vendor's shops.

The purchaser and / or verifier shall review test records and certification prior to releasing the equipment.

All testing shall be carried out at the Vendors test facility.

Test equipment shall be supplied by the Vendor and shall be calibrated within six months of the test date. All test equipment used shall have current certification of accuracy from an approved test authority.

All test equipment shall be calibrated and used in accordance with the Vendors QA system.

The Vendor shall maintain up-to-date documentation at all times reflecting the inspection/testing status of the equipment.

Certificates of Test shall be provided for each item of equipment to prove it has been satisfactorily tested to meet all requirements of its appropriate manufacturing standards, whether or not witnessed by the Purchaser.

Where appropriate, test certificates shall state values for all test results. Tests for which the results are indicated as pass or fail shall be qualified by the relevant acceptance criteria.

The submittal documentation shall not be regarded as the total requirement. The purchaser may wish to inspect retained documentation such as internal test results, equipment logs and fault/correction records.

7.3.2 Test requirements

In general, the Vendor's standard works test procedures shall be followed and shall include the following:

- Visual checking (All valves)
- Dimensional checking against Purchaser approved Vendor drawings (All valves). The face to face dimensions of flanged globe-body control valves shall confirm to ISA S75.03, S75.08, or S75.16.All dimensions (including overall height) shall be as shown on Manufacturer's drawings.
- Flange face finish checking (All valves)
- Hydrostatic testing to IEC 60534-4 (All valves)
- Function Testing (All valves)
- Hysteresis and Dead Band Test (Random sample – Purchaser to advise numbers)
- Speed of response, overshoot & non-linearity. (Random sample - Purchaser to advise numbers)

- Fugitive Emissions Test (it shall be demonstrated that the level of fugitive emissions measured on the valves under test are representative for all valves supplied. Vendor to advise no of valves to test based on variations in packing / valve style.)
- NDE Test (All valves)
- Material Test and traceability reports shall be provided (All valves)
- Paint repair (as necessary)

7.3.3 Function Testing

The control valve shall be completely assembled and fitted with all accessories, positioner, volume boosters etc.

Test shall include the following as a minimum:

- Positioner shall be checked for correct calibration.
- Stroking Times and fail safe position shall be checked
- Check the correct operation of the hand wheel where fitted
- Correct operation of limit switches and position transmitters
- Special attention should be paid during testing of the actuator. The following needs to be ensured:
  - Verify selected actuator is in line with the required functionally direct or reverse action as required to achieve required valve position.
  - Establish that actuator performance is unaffected by reducing pneumatic supply to minimum design value specified in data sheets.
  - Ensure speed of response (including accessories) is in line with requirements specified.
  - Wherever equipped with fail lock mechanism the required functionally check shall be carried out with the inclusion of these accessories and required valve position verified.
- Hysteresis check (refer to section 5.7.5 for acceptance criteria)
- Stem position error shall not exceed +/- 5% of rated travel
- Dead band check (refer to section 5.7.5 for acceptance criteria)

For definition of test procedures refer to IEC 60534-1 and IEC 60534-4.

The hysteresis test shall consist of measuring the valve stem position in response to the following sequence of input signals 50%, 75%, 100%, 75%, 50%, 25%, 0%, 25% and 50%.

The dead band expressed as a % of the input span shall be measured of the 5%, 50% and 95% of the input span.

7.3.4 Positive Material Identification (PMI)

PMI is required for austenitic stainless steel materials covering pressure containing and wetted components. This shall be carried out during the final stages of manufacture to confirm that the materials of construction are as specified. Vendor to develop PMI procedure and shall be approved by purchaser prior to manufacture. Instruments or methods shall be of the type that will provide quantitative, recordable, elemental composition results for the positive identification of the alloy elements present.

7.3.5 Seat Leakage Test

The seat leakage test shall be in accordance with ANSI/FCI-70.2 with the acceptance criteria for the specified shut-off class. If the shut-off class is not specified, the following acceptance criteria shall apply:

Seat type	Acceptance Criteria
Single-Seated valve	Class IV

For each valve tested, the Manufacturer shall state the following data:

- Flow direction
- Test Medium
- Test Differential Pressure
- Seat leakage flow rate measured
- Allowable seat leakage flow rate
- Seat leakage class (if applicable)

7.3.6 Material Testing and NDE

Material testing and non-destructive examination shall be in accordance with "BK21-002-TS-TP1-SP-02_Specification for Manual Valve".

7.3.7 Factory Acceptance Test (FAT)

Witnessed Inspection and function testing shall include a full factory acceptance test (F.A.T) of the actuators at the actuator works, FAT at the valve Vendor works, followed by a full F.A.T of the combined valve and actuator.

7.3.8 Corrections, Errors and Defects

If the corrections of any error or defect involve serious alterations requiring replacement of parts, or major removal, and replacement of welds, the approval of the Purchaser shall be obtained before proceeding with such corrections. Also, if the correction of the error requires witnessing by the Inspector or a change in certificates issued by the Inspector, the correction shall be made in the presence of the Inspector, and the affected certificates shall be properly corrected and signed.

Equipment or parts thereof, including materials of construction on which are found irreparable or injurious defects, improper fabrication, excessive repairs or that are not in accordance with the requirements of the drawing or Specification shall be subject to rejection at the discretion of the Purchaser. The equipment shall also be subjected to rejection if such conditions are discovered after release from the Vendor's works.

If any part of the equipment is damaged after tests have been completed, retesting of the affected parts is mandatory. The method of repair shall be approved by the Purchaser prior to work being started on it.

Weld repairs are permissible for castings only. Welding is to be in accordance with ASME IX.

7.3.9 Rejection

Should any valves be found damaged on delivery, or in any way not in compliance with the terms of this Specification, they shall be rejected. The Vendor shall immediately replace them free of charge with sound valves complying with the Purchase Order.

Should any defects in the valve be revealed during fabrication, installation, or whilst under normal test conditions, the valve shall be rejected. The Vendor shall immediately replace it free of charge with a sound valve complying with the Purchase Order.

7.3.10 Commissioning and Startup

The Vendor, in their tender, shall identify any special requirements or recommendations for Vendor support during offshore commissioning and start-up of the equipment supplied. The Purchaser's final acceptance of the equipment will be subject to a performance test once the equipment has been installed and commissioned offshore.

7.3.11 Site Support

The Vendor, in their tender, shall provide details of their after sales support capability. Vendors shall advise their nearest service representative and nearest service facility.

8. PREPARATION FOR SHIPMENT

The Vendor shall be responsible for preparation for shipment including: packing, protection, preservation, labelling and marking of all items.

All ports and openings shall be sealed. Threaded connections shall be protected with metallic or moulded plastic caps or plugs.

Line connections shall be covered with wooden, plastic or metal friction plugs, caps or flanges to exclude foreign material from the interior of the valve and to fully protect the faces of flanges from damage during shipment.

Machined surfaces which may be exposed to the atmosphere in transit and subsequent storage shall be protected with an easily removable rust preventative coating applied by the Vendor, but not until inspection, if required, has been completed.

Where temporary blocking devices are used in the equipment to brace the equipment for shipment, a location list showing the exact location of these blocking devices shall be provided to the Purchaser.

Equipment shall be shipped completely assembled.

All equipment shall have been fully tested and inspected prior to packaging. No packaging activities shall commence without the prior consent of the Purchaser. The purchaser shall be notified of the dates of packaging with sufficient notice to allow attendance for completion of inspection and release certificates without affecting the required delivery schedule.

One copy of the IOM manual shall be shipped with each equipment type included in an order.

9. SPARE PARTS AND SPECIAL TOOLS

9.1 Spares

The Vendor shall identify the following spares:

- Pre-commissioning, commissioning and start-up spares
- Recommended spares list for two years' operation

Spares shall be itemized and priced with the Tender.

9.2 Special Tools

The Vendor shall identify all necessary special tools (including software tools) required to perform routine maintenance and any other recommended tools for specialized procedures.

Special tools shall be itemized and prices with the Tender.

The Purchaser shall agree the Special Tools to be included in the Purchase Order.

10. CONFLICTS AND ORDER OF PRECEDENCE

In the event of any conflict arising between this Specification and other documents listed herein, refer comments to the Purchaser for clarification before design or fabrication commences. The order of precedence that applies is as follows:

- Applicable Statutory Codes and Standard
- Purchase Order
- Project Data Sheets
- This Specification
- Project Drawings
- Project Reference Documents
- Company Documents

- ❖ International Codes and Standards

11. WARRANTY

The VENDOR shall provide warranty support for a period defined in the PURCHASER's Material Requisition, and also in Terms and Conditions. Warranty shall apply to defective material, workmanship, facility design and/or accessories for the equipment.

Warranty work shall be performed at the PURCHASER's facilities. The cost of diagnostics and/or correction of any warranty items shall be borne by the VENDOR.

12. DOCUMENTATION

VENDOR shall include within the quotation the documentation as requested in the Material Requisition and in the quantities specified therein. As a minimum, this should include any documentation, certificates etc. requested within this specification.

VENDOR shall also include in the quotation a Vendor Document Requirements Listing (VDRL) confirming the documents and timing of submission for detail design and fabrication documents as required by the Material Requisition.

The VENDOR shall be responsible for the production of the following documentation:

- a. Project management, scheduling and coordination documentation.
- b. Design documentation and drawings and as built.
- c. Testing and commissioning checklists and procedures.
- d. Operating and maintenance manuals and validation manual. The validation manual shall be provided with the diskette in latest version of Excel or Word.
- e. Equipment, testing and third party certification.
- f. Installation and commissioning drawings including interfacing wiring diagrams and loop drawings as per VENDOR Document Requirements List (VDRL).

In addition, the test results from the factory test shall be made available to the COMPANY as part of a package of final certified documents and drawings.

As a minimum, the VENDOR shall provide at least the following documentation for approval:

- Overall dimensions,
- Dimensional outline drawings with weights and clearance required for maintenance,
- Face to face dimensions, rating and facing,
- Actuator type and size,
- Material of body, trim, etc.,
- Specifications and data sheets,
- Installation details,
- Constraints of the certificate of conformity/Functional safety assessment report
- Material certificate conformity,
- Material certificate compliance,
- ATEX certification,
- IP certificate
- Test results of the Inspection and Testing Report.

VIETSOVPETRO

INSTALLATION OF A PRESSURE CONTROL VALVE (PCV) AT THE OUTLET OF THE DAI HUNG GAS COMPRESSOR

Approved by
Deputy General Director
"VIETSOVPETRO"

Signed by: Đặng Đức Phong
Date: 26/03/2026 09:32:15
Certified by: Vietsovpetro CA

DANG DUC PHONG

TECHNICAL EVALUATION CRITERIA FOR VALVES; PIPING; FITTING AND STRUCTURE MATERIALS

Project: Oil and gas contract for block 04-3

Rev: 0

ISSUE FOR BID

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TECHNICAL EVALUATION/ *КРИТЕРИЯ ОЦЕНКИ*

Tender technical proposal shall be evaluated through 2 steps for each Group/ Item, detailed as below:

Step 1: Technical proposal shall be passed Step 1 if it meet ALL the condition as below:

No.	Requirements	Evaluated	Remark
1	Year of Manufacture as Item 3 in Technical requirement	Pass/Fail	
2	Warranty as Item 3 in Technical requirement	Pass/Fail	
3	Experience as Item 7 in Technical requirement	Pass/Fail	Apply for Group 1

Step 2: ***Step 2 shall be evaluated if the technical tender proposal Passed in step 1 - Detailed scores of technical evaluation as below/*** *Этап 2: Предложения, которые оценены как "Удовлетворительно" всем вышеупомянутым дисквалифицированным условиям, будут оцениваться на этапе 2 — Детальная оценка в соответствии с критериями согласно следующей «КТО»*

Index			Evaluation Criteria	Proposal	Levels			Reject Point	Note
					I	II	III		
I			**General requirements for GOODS**		**20**				Note 1
	1		Condition of goods			50%			
		1.1		New, unused			100%		
		1.2		Used, restored goods			0%		

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Index			Evaluation Criteria	Proposal	Levels			Reject Point	Note
					I	II	III		
	2		Content of Proposal			50%			
		2.1		Bidder fully indicates information about the name, specification, type, manufacturer, model, origin, etc. to suit technical requirement.			100%		
		2.2		Not enough information but enough to evaluate			60% ~ 90%		Note 2
		2.3		Not enough information to evaluate			0%		
II			**Technical requirements**		**35**				Note 1
	1		GOOD feature			10%			
		1.1		Fully comply as required in Technical Requirement			100%		
		1.2		"Comply with minor concern" or "major concern" but acceptable (check for each Requirement)			60% ~ 90%		Note 2
		1.3		Not comply with requirements and can't be acceptable			0		
	2		Major technical requirement			90%			
		2.1		Fully comply as required in Technical Requirement			100%		
		2.2		"Comply with minor concern" or "major concern" but acceptable (check for each Requirement)			60% ~ 90%		Note 2
		2.3		Not comply with requirements and can't be acceptable			0%		

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Index			Evaluation Criteria	Proposal	Levels			Reject Point	Note
					I	II	III		
III			**Manufacturer and Origin**		**15**				
	1		Manufacturer			70%			Note 1
		1.1		Vendor listed in Technical Requirement			100%		
		1.2		Not in Vendor listed but provide enough information (*manufacturing capacity, experience, manufacturing procedure, facility, certification system, similar contracts, etc.*) to evaluate			70%		
		1.3		Other			0%	**R**	
	2		Origin of GOODS			30%			
		2.1		G7 / Russia / Europe / Korea / Australia			100%		
		2.2		Singapore / Thailand / Malaysia/ Việt Nam / India / Israel / Quata/ UAE / Brazil / Mexico / Argentina/ Indonesia			70%		
		2.3		Other countries			25%		
IV			**Delivery place and delivery *time***		**5**				Note 1
	1		Delivery time			60%			
		1.1		Fully comply as required in Technical Requirement			100%		
		1.2		Later than requirement (minus10% for each day delay) but not over 5 days			60% ~ 90%		Note 2
		1.3		Delay over 5 days than requirement			0%	**R**	Note 3

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Index			Evaluation Criteria	Proposal	Levels			Reject Point	Note
					I	II	III		
	2		Delivery place			40%			
		2.1		Comply as required in Technical Requirement			100%		
		2.2		Not delivery to VSP warehouse			0%	R	
V			**Quantity and packing**		5				
	1		Quantity			70%			
		1.1		Comply as required in Technical Requirement			100%		
		1.2		Not enough quantity for each item			0%	R	
	2		Packing			30%			
		2.1		Comply as required in Technical Requirement			100%		
		2.2		Not comply as required in Technical Requirement			0%		
VI			**Technical documentation**		10				
	1		Submit with bid document			60%			Note 2
		1.1		Fully comply as required in Technical Requirement			100%		
		1.2		"Comply with minor concern" or "major concern" but acceptable (check for each Requirement)			60% ~ 90%		Note 2
		1.3		Not comply with requirements and can't be acceptable			0%	R	
	2		Submit upon delivery			40%			
		2.1		Bidder confirm to provide as Technical Requirement			100%		

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					I	II	III		
		2.2		Bidder confirm to provide as Technical Requirement but can accept			70%		
		2.3		Not comply with requirements and can't be acceptable			0%		
VII			**Certification**		**10**	100%			
	1	1.1		Fully comply as required in Technical Requirement			100%		
		1.2		"Comply with minor concern" or "major concern" but acceptable (check for each Requirement)			60% ~ 90%		Note 2
		1.3		Not comply with requirements and can't be acceptable			0%	**R**	
VIII			**TOTAL SCORES (100 as maximum)**		**100**				

Notes:

1. For this item is subject to evaluate in range of 0-100% that correspond to BIDDER's technical proposal
2. a. Each "minor concern" shall be minus 10%. "Minor concern" is defined as not fully comply to minor requirement but acceptable (check for each Requirement).
   b. Each "major concern" shall be minus 20%. "Major concern" is defined as as not fully comply to major requirement but acceptable (check for each Requirement).
3. During the Bid evaluation stage, for goods originating from countries in armed conflict, or being sanctioned or embargoed, from which the import of the goods may affect the contract performance and delivery schedule, explanations and commitments on the ability to deliver goods must be provided for the Procuring Entity to make evaluations.

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Based on the actual situation at that time, the Procuring Entity has the right to review and decide to reject the bids, or not to continue the evaluation, if the Procuring Entity considers that there is any risks of failures in the contract performance and delivery schedule. In that case, the score of this item will be ZERO point.

Passed Conditions: All of the below conditions:

- Passed in "**Step 1**"
- No "**R**" designated point
- No ZERO point (Note 3)
- And total score of Item "VIII" is **equal or higher than 80 points**

Disqualified Conditions: One of the below conditions:

- Disqualified in "**Step 1**"
- Or One (01) or more "**R**" designated point
- Or One (01) or more ZERO point (Note 3)
- Or total score of Item "VIII" is **less than 80 points**

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