

BIDDING DOCUMENTS

Package number: 01

**Package: Engineering, Supply, and Installation of HSS
System Equipment**

Project: HSS System Capacity Enhancement

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SUMMARY

PART I - BIDDING PROCEDURES

Chapter I. Instructions to Bidders (ITB)

This Chapter provides information to help Bidders prepare their bids. Information is also provided on the submission, opening, and evaluation of bids and on the award of Contracts. **Chapter I contains provisions that are to be used without modification.**

Chapter II. Bid Data Sheet (BDS)

This Chapter includes provisions that are specific to each procurement and that supplement Chapter I, Instructions to Bidders.

Chapter III. Bid Evaluation Criteria

This Chapter specifies the criteria to be used to evaluate bids and bidders' qualification and experience for performing the contract.

Chapter IV. Bidding Forms

This Chapter includes the forms to be completed and submitted by bidders as a constituent part of their bids.

PART II – TECHNICAL REQUIREMENTS

Chapter V. Technical Requirements

This Chapter includes the List of Goods and Related Services, the Delivery and Completion Schedules, the Technical Specifications and the Drawings that describe the Goods and Related Services to be procured; the Inspection and Tests (if any).

PART III – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Chapter VI. General Conditions of Contract (GCC)

This Chapter includes the general clauses to be applied in all contracts of different procurements. This Chapter contains provisions that are to be used without modification.

Chapter VII. Special Conditions of Contract (SCC)

This Chapter includes contract information and clauses specific to each contract. The Special Conditions of Contract modify or supplement but do not replace General Conditions of Contract.

PART IV. CONTRACT FORMS

This Part includes the forms, which, once completed, are constituent parts of the Contract. The forms for Performance Security and Advance Payment Security (if there is a requirement for advance payment) shall only be completed by the successful Bidder prior to the entry into force of the Contract.

ABBREVIATION

Purchaser	Purchaser under purchasing equipment project, Employer of a package under regular purchasing framework.
Project	Equipment investment project or regular purchasing framework.
BDS	BID DATA SHEET (BDS)
ITB	INSTRUCTIONS TO BIDDERS
GCC	General Conditions of Contract
SCC	Special Conditions of Contract
BD	Bidding Documents
Proposals	Proposals prepared by Bidder
Public Procurement Law	Public Procurement Law No 22/2023/QH15; Law No 57/2024/QH15; Law No 90/2025/QD15
Decree 214/2025/ND-CP	Decree No. 214/2025/ND-CP on Detailed Provisions on Certain Articles and Implementation Measures of the Law on Bidding regarding Contractor Selection
Circular No. 79/2025/TT-BTC	Circular No. 79/2025/TT-BTC dated August 04, 2025 of the Ministry of Finance providing guidance on the provision and disclosure of bidding information and standard bidding documents on the Viet Nam National E-Procurement System.
VND	Viet Nam Dong
USD	United States dollar
ABC	ABC Corporation
JV	Joint-Venture (or Co-bidding/Consortium)

PART I

BIDDING PROCEDURES

CHAPTER I. INSTRUCTIONS TO BIDDERS

1. Scope of Procurement Package	1.1. The Employer stipulates in the BDS issues these Bidding Documents for selecting contractors to implement the goods procurement package using the one-stage two-envelope method. 1.2. The name, ID number, and number of lots (if the procurement is divided into independent lots) of the procurement are provided in the BDS. 1.3. The contract duration specified in the BDS.
2. Sources of Funding	Sources of funding (or method for financing arrangements) to be used for the procurement are specified in the BDS.
3. Prohibited Acts	3.1. Offering, receiving or brokering a bribe. 3.2. Abusing one's position and power to illegally intervene in procurement. 3.3 Collusion, including the following practices: a) Collusion, agreement, coercing in order for one or more parties to prepare bids or withdraw bids so that one party wins the bid; b) Collusion, agreeing to refuse to supply goods or services, not signing subcontracts or making other agreements to limit competition so that one party wins the bid; c) A bidder has the capability and experience, participated in the bidding, and met the requirements of the bidding documents but deliberately did not provide documents to prove its capability and experience when requested for clarification of the bids Submission or when asked to cross-check documents to create favorable conditions for a party to win the bid. 3.4. Frauds, including the following practices: a) Falsifying or altering information, documents, or records in the bidding process; b) Intentionally providing untruthful or biased information and documents in the bid submission to distort the results of contractor selection. 3.5. Obstruction, including the following practices: a) Destroying, deceiving, altering, concealing evidence, or making false reports; threatening or suggesting to any party to prevent the clarification of acts of giving, receiving, or brokering

	bribes, fraud, or collusion with supervisory, inspection, auditing, or authorized agencies; b) Obstructing authorized persons, investors, bid solicitors, or contractors in the selection of contractors; c) Obstructing the supervisory, inspection, or auditing activities of authorized agencies regarding the bidding process; d) Deliberately filing false complaints, accusations, or petitions to hinder the bidding process. e) Engaging in unlawful acts concerning cybersecurity to interfere with or obstruct the bidding process. 3.6. Failing to ensure fairness, transparency, including the following practices: a) Being a bidder participating in the packages for which it is The employer or Purchaser or performs tasks of The employer or Purchaser; b) Involving in both preparation and appraisal of BD under the same procurement package; c) Involving in both evaluations of bids and appraisal of the contractor selection results under the same procurement package; d) Being directly involved in the contractor selection process as a member of Employer or of the employer, or being involved as a member of the evaluation team or contractor selection result appraisal team for procurement packages in which their natural father or mother, or father or mother in law, or spouse, natural child, adopted child, son or daughter in law, or natural brother (s) or sister (s) participates as a bidder or the legal representative of a bidder. e) Bidders bidding for a procurement package of goods for which they have provided the consulting service before; f) Bidding for a procurement package under a project administered by their former employer within 12 months from his or her resignation from such agency or organization; g) Specifying a specific brand name or origin of goods as a requirement in the bidding document; except for the cases specified in Point e, Clause 3, Article 10, Clause 2, Article 44 and Clause 1, Article 56 of the Law on Bidding;
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	h) Specify conditions in the bidding document to limit the participation of bidders or to create advantages for one or several bidders, causing unfair competition, violating the provisions in Clause 3, Article 44 of the Law on Bidding; 3.7. Divulging or receiving the following information or documents on the bidder selection process, except for circumstances stipulated in paragraph b, Item 8 of Article 77, Item 11 of Article 78, paragraph h, Item 1 of Article 79, Item 4 of Article 80, Item 4 of Article 81, Item 2 of Article 82, paragraph d, Item 4 of Article 93 of Law on Bidding, including: a) Contents of BD prior to the official issuance of the BD as stipulated; b) Content of bids; content of the request for clarification of bids of the Employer and the response of the bidder during the process of evaluating bids; report of the Employer, report of the expert team, appraisal report, report of the consulting contractor, report of the relevant professional agency during the process of selecting the contractor; note-taking books, minutes of the bid evaluation meeting, comments and assessments for each bids before being made public according to regulations; c) Bidder selection results prior to the publication as required; d) Other relevant documents in the process of bidder selection that are marked 'confidential' in accordance with laws. 3.8. Contract assignment, including the following activities: a) The contractor transfers to another contractor a part of the work in the bid package that exceeds the maximum value for the subcontractor and the volume of work for the special subcontractor stated in the contract; b) The contractor transfers to another contractor a part of the work in the bid package that does not exceed the maximum value of the work for the subcontractor stated in the contract but is beyond the scope of work for the subcontractor proposed in the bid without the approval of the investor or the supervision consultant; c) The investor or the supervision consultant approves the contractor to transfer the work specified in paragraph a of this Item; d) The investor or the supervision consultant approves the contractor to transfer the work specified in paragraph b of this
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	Clause that exceeds the maximum value of the work for the subcontractor stated in the contract.
4. Eligibility of Bidders	4.1. Contractors as organizations must meet the following conditions: a) Have independent financial accounting; b) Not in the process of carrying out dissolution procedures or having their enterprise registration certificate, cooperative registration certificate, union of cooperatives registration certificate, or cooperative group registration certificate revoked; not in a state of insolvency according to bankruptcy laws; c) Ensure competition in bidding as prescribed in the BDS; d) Not currently banned from participating in bidding according to the Law on Bidding; e) Not under criminal prosecution; f) Not in a state of suspension or termination of participation in the System. 4.2. Contractors as household businesses must meet the following conditions: a) Have a business registration certificate in accordance with the law; b) Not in the process of terminating operations or having their business registration certificate revoked; the household business owner is not under criminal prosecution; c) Meet the conditions specified in points c, d, and f of Item 4.1 of the ITB. 4.3. Contractors as individuals or groups of individuals offering their innovative products that meet the provisions of Clause 4, Article 6 of Decree No. 214/2025/ND-CP , detailing certain articles and measures for implementing the Law on Bidding regarding contractor selection (hereinafter referred to as Decree No. 214/2025/ND-CP), are eligible to participate in bidding when meeting the following conditions: a) Have full legal capacity in accordance with the law of the country of which the individual is a citizen; b) Meet the conditions specified in points c, d, e, and f of Item 4.1 of the ITB. 4.4. For procurement packages with a package value under VND 500 million that belong to procurement estimates, the

	application of procuring goods from contractors with 50% or more of the workforce being disabled people, war veterans, or ethnic minorities, with labor contracts of at least 03 months or more and still valid at the time of bid closing, is regulated under Clause 1, Article 8 of Decree No. 214/2025/ND-CP shall conform to the BDS. 4.5. There is a consortium member or subcontractor that is a Vietnamese contractor in accordance with the provisions in the BDS.
5. Eligibility of Goods and Related Services	5.1. All the Goods and Related Services to be supplied under the Contract may be considered eligible if they have clear and lawful origin. 5.2. For purposes of this Clause, the term “goods” includes raw material, machinery, equipment, spare parts; consumer items; and medical supplies used in the health facilities. The term “origin” means the country or territory where a product is wholly obtained or produced completely; or the place where the last substantial transformation took place for a product which has been produced in more than one country. “Related Services” includes services such as warranty, maintenance, repair, provision of spare parts or other after-sale services such as, technology transfers, etc. 5.3. The Bidder must specify the origin, markings and labels of Goods and provide supporting documents to establish the eligibility of Goods and Related Services as specified in ITB Item 5.1 and prescribed in BDS.
6. Contents of Bidding	6.1. The Bidding Documents consists of Part I, II, III, in conjunction with any Addendum issued in accordance with ITB 8 (if any), which include all the Chapters indicated below: Part I. Bidding Procedures: Chapter I. Instructions to Bidders (ITB); Chapter II. Bidding Data Sheet (BDS); Chapter III. Bid Evaluation Criteria; Chapter IV. Bid Forms. Part II. Technical Requirements: Chapter V. Technical Requirements;

	Part III. Conditions of Contract and Contract Forms: Chapter VI. General conditions of Contract (GCC); Chapter VII. Special conditions of Contract (SCC); Part IV. Contract Forms. 6.2. The investor shall not be responsible for the accuracy or completeness of the Bidding Documents, explanatory documents clarifying the Bidding Documents, or any documents amending the Bidding Documents as stipulated in Item 8 of the ITB if these documents are not provided by the investor on the System. The Bidding Documents issued by the investor on the System will be the basis for consideration and evaluation. 6.3. The contractor must study all information in the Invitation for Bids, Bidding Documents, and the content of amendments and clarifications to the Bidding Documents, as well as the minutes of the pre-bid meeting (if any) to prepare the Bid Submission in accordance with the requirements of the Bidding Documents.
7. Clarification of Bidding Documents	7.1. A prospective Bidder requiring any clarification of the Bidding Documents shall contact The employer in writing or ask questions in the pre-bidding convention (if any). The employer shall respond in writing to any request for clarification, provided that such request is received no later than a given number of days prior to the bid closing time as specified in BDS. The employer shall forward copies of its response to all those who have acquired the Bidding Documents directly from it, including a description of the inquiry but without identifying its source. Should The employer deem it necessary to amend the Bidding Documents as a result of a clarification, it shall do so following the procedure under ITB Item 8 and ITB Item 22.2. 7.2. The employer may hold a pre-bidding meeting to discuss any clarification required by Bidders where necessary. The discussion shall be recorded by The employer in writing and made in the form of Clarification of Bidding Documents and forward to each and every Bidder that has bought or obtained the Bidding Documents from The employer. Should The employer deem it necessary to amend the Bidding Documents as a result

	of a pre-bidding meeting, it shall do so following the procedure under ITB Item 8. The minutes of the pre-bidding meeting shall not constitute an amendment to the Bidding Documents. Absence from the pre-bidding meeting is not a reason for disqualifying a Bidder.
8. Amendment to Bidding Documents	8.1. The BD may be amended at any time prior to the bid closing time via the issuance of an addendum. 8.2. Any addendum issued shall be part of the Bidding Documents and shall be communicated in writing to all who have obtained the Bidding Documents directly from The employer . 8.3. Each addendum shall be sent to all Bidders who have obtained the Bidding Documents directly from Employers within a given time as specified in the BDS. To give prospective Bidders reasonable time in preparing their bids, The employer may extend the bid closing time, pursuant to ITB Item 22.2. The Bidder must notify The employer of the receipt of the addendum by any of the following means: in-person delivery, by post, by fax or email.
9. Cost of Bidding	The Bidding Documents shall be issued free of charge on the System immediately after The Employer successfully posts the Invitation for Bids on the System. The Bidder shall bear all costs associated with the bidding process. The bid submission fee shall comply with the provisions of the BDS. In any case, The Employer shall not be responsible or liable for any costs related to the Bidder's participation in the bidding.
10. Language of Bid	The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and The employer , shall be written in the language specified in the BDS.
11. Constituent elements of the Bid	The Bid shall consist of the Technical Proposal and Financial Proposal as follows: 11.1. The Technical Proposal shall include all the administrative and legal documentation, documentary evidence of bidder qualification and experience, and the technical proposal of the bidder as required in the BD. Specifically: a) Letter of Bid as part of the Technical Proposal in accordance with ITB Item 12;

	b) Joint venture agreement (for any Bidder in a joint venture) using Form No. 03 Chapter IV - Bid Forms; c) Bid Security, in accordance with ITB Item 19; d) Documentary evidence of bidder eligibility in accordance with ITB Item 4 e) Written confirmation of the authority of the signatory of the Bid in accordance with ITB Item 20.3; f) Documentary evidence establishing the Bidder's qualifications and experience in accordance with ITB Item 17; g) Technical Proposal and documents evidencing the conformity of the Goods and Related Services in accordance with ITB Item 16; h) Bill of Material: detailed of configuration of equipment/service without price in accordance with Form No.17 (a1.1), 17 (a2.1), 17 (b.1), and Form No.18.2 Chapter IV – Bid Forms; i) General Conditions of Contract, Specific Conditions of Contract and Contract Form. The Technical Proposal shall not contain any financial information. Should the Technical Proposal include any material financial information, the Bidder shall be subject to a disadvantage during the bid evaluation process 11.2. Financial Proposal shall include the following: a) Letter of Bid as part of the Financial Proposal in accordance with ITB Item 12; b) Financial Proposal and fully completed tables/schedules as required in ITB Item 12 and Item 14. 11.3. Proposal of Alternative Technical Solution, in accordance with ITB Item 13, accompanied by the financial proposal for such Alternative Technical Solution (if any); 11.4. Any other document specified in the BDS.
12. Letter of Bid and Tables /Schedules	The Bidder shall submit the Letter of Bid and all the relevant schedules/tables using the forms furnished in Chapter IV - Bid Forms.

13. Proposal of Alternative Technical Solution	13.1 Only if the BDS of the Bidding Documents explicitly allows the bidder to propose an alternative technical solution, the alternative proposal is considered. 13.2. The Alternative Technical Solution shall only be considered when the main solution is evaluated as responsive to the requirements and the Bidder is ranked the first. Under such circumstance, the Bidder shall provide all the information needed for The employer to evaluate the alternative solution, including explanatory notes, drawings, technical specifications, delivery schedule and other relevant information. The evaluation of Alternative Technical Solution shall comply with Section 5 of Chapter III – Bid Evaluation Criteria.
14. Bid Price and Discount	14.1. The bid price stated in the Letter of Bid and in the Price Schedules, together with any discounts, must comply with the provisions of this Section: a) The bid price is the price offered by the bidder in the Letter of Bid (before discount), covering all costs required for Performance of the package, in accordance with the requirements specified in Part II – Technical Requirements. b) All lots (for packages divided into lots) and all items must be separately quoted in the Bid Price Schedules. c) For packages not divided into lots, if the bidder proposes a discount, percentage discount shall be stated in the Letter of Bid. Such discount shall be understood as applied uniformly on a proportional basis to all items in the Bid Price Schedules. For fixed unit price or adjustable unit price contracts, the discount shall be calculated on the bid price exclusive of contingencies. 14.2. The Bidder shall submit the Bid for the whole work specified in ITB Item 1.1 and state the bid unit price and amount of all items listed in the columns “List of Goods” and “Description of services”, using the forms prescribed in Chapter IV - Bid forms. Where an item is not priced (leave blank or insert “0”) in the columns “Unit Price” and “Total Price”, its price shall be

	deemed to have been allocated to other goods or services of the procurement, the Supplier is obligated to provide such item as required by the BD without any payment by Employer in the course of contract performing. In each Price Schedule, the bidder shall quote as specified in the BDS. 14.3. In case of discount, the discount(s) offered by the Bidder shall be proposed either directly in the Letter of Bid or in a separate Letter of Discount. The Bidder shall specify the discounting method and discounted items mentioned in Columns “List of Goods” and “Description of Services”. If discounting method is not specified, it shall be understood that all items mentioned in the columns “List of Goods” and “Description of Services” receive equal discounts. The Letter of Discount may be submitted separately or together with the Bid as long as it is received by Employer before the bid closing time. Any Letter of Discount separately submitted shall comply with ITB Items 21.1 and 21.3. The Letter of Discount shall be preserved as part of the Bid and opened together with the Bid. 14.4. The bidder shall be responsible for the bid price to perform and complete the works in accordance with the requirements specified in the Bidding Documents. In case the bid price, after deducting any discount (if applicable), is abnormally low and may affect the quality of the package, the Employer shall handle the situation in accordance with Clause 11, Article 140 of Decree No. 214/2025/ND-CP. The bidder’s bid price must include all applicable taxes, charges, and fees (if any), calculated at the tax rates and fee levels effective 28 days prior to the bid closing date. If the bidder declares that the bid price excludes such taxes, charges, and fees (if any), the bidder’s Bid shall be disqualified 14.5. In case a bidding package is divided into multiple independent lots and bidding by lot is permitted, a bidder may submit a bid for one or more lots. The bidder must submit a complete bid for all items within each lot it participates in. Where the bidder proposes a discount, it shall be made in one of the following two ways:
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	a) First method: indicate percentage discount in the Letter of Bid (in this case, the bidder is deemed to apply the same percentage discount uniformly to all lots for which it submits bids); b) Second method: indicate percentage discount for each lot in the Letter of Bid. 14.6. If the Bidder detects any inaccuracy in quantity of the items mentioned in columns “List of Goods” and “Description of Services” in comparison with the design or requirements prescribed in Section 1 of Part II – Technical Requirements, the Bidder may notify Employer and make a separate Price Schedule for the quantity deviation for Employer to consider. The Bidder may not include the price of such quantity deviation in the Bid Price.
15. Bid currency and payment currency	The Bid currency and payment currency shall be specified in the BDS.
16. Documents Establishing the Conformity of the Goods and Related Services	16.1. To establish the conformity of the Goods and Related Services with the Bidding Documents, the Bidder shall furnish as part of its Bid the documents evidencing that the Goods conform to the technical requirements set forth in Chapter V – Technical Requirements. 16.2. The term “goods” shall be understood to include machinery, equipment, raw materials, fuels, materials, supplies, spare parts; products; vehicles; consumer goods; chemicals, testing supplies, medical equipment; commercial software. 16.3. The term “origin” shall be understood as the country or territory where the goods are mined, bred, grown, produced, manufactured, or processed, through manufacturing, processing, or assembling in such country or territory to create a product that is commercially recognized and substantially different in fundamental characteristics from its original components. 16.4. The term “related services” shall include services such as insurance, installation, initial maintenance and repair, or the provision of other after-sales services such as training, technology transfer, etc. 16.5. The bidder shall declare the origin of goods in Form No. 10B, Section IV. In case the bidder offers multiple origins for

	one unit of goods (one piece, one item, etc.) but of the same manufacturer and at the same unit price, the Employer shall request the bidder to clarify in order to determine the specific origin of such goods. 16.6. Requirements on the origin of goods shall be carried out in accordance with Forms No. 01A, 01B, 01C, Section IV. Where the Employer requires origin by group of countries or territories as prescribed in Clause 2, Article 44 of the Law on Bidding, the bidder must offer goods of the required origin or of Vietnamese origin, even in cases where Viet Nam is not included in the required group of countries or territories. A bidder offering goods without the required origin as specified in the Bidding Documents, or not of Vietnamese origin, shall be disqualified. In case the Employer requires goods of Vietnamese origin in accordance with Point e, Clause 3, Article 10 of the Law on Bidding, a bidder offering goods not of Vietnamese origin shall be disqualified. 16.7. The bidder shall declare the manufacturer of the goods in Form No. 10B, Section IV. In case the bidder offers multiple manufacturers for more than one unit of goods (two pieces, two items, etc.), the Employer shall request the bidder to clarify the corresponding quantity for each manufacturer. In case the bidder offers multiple manufacturers for one unit of goods (one piece, one item, etc.), the bidder's E-Bid shall not be considered for evaluation. 16.8. The bidder must specifically propose the model code (if any), brand name, origin, and manufacturer. If the bidder fails to specifically propose the model code (if any), brand name, origin, and manufacturer, the Bid shall not be considered for evaluation (the bidder must not refer to other parts of the Bid but must specify in Form No. 10B, Section IV). In case of discrepancies between the information declared in Form No. 10B, Section IV and the attached documents, the information in Form No. 10B shall prevail for evaluation, except where the model code (if any), brand name, or manufacturer declared in Form No. 10B, Section IV does not exist in the market.
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	16.9. The documentary evidence may be in the form of literature, drawings or data, and shall consist of a detailed, item-by-item description of the basic technical and performance characteristics of the Goods and Related Services, demonstrating substantial responsiveness of the Goods and Related Services to the requirements set forth in the BD and a statement of deviations and exceptions (if any) as compared against the provisions of Chapter V - Technical Requirements. 16.10. The Bidder shall also furnish a list giving full particulars, including prices, of spare parts, special tools, etc. that are necessary for the proper and continuing functioning of the Goods during period specified in the BDS following commencement of the use of the goods. 16.11. Standards for workmanship, process, material, and equipment, as well as references to brand names or catalogue numbers specified by Employer in Chapter V - Technical Requirements, are intended to be descriptive only and not restrictive. The Bidder may offer other standards of quality, brand names, and/or catalogue numbers, provided that it demonstrates, to Employer's satisfaction, that the substitutions ensure substantial equivalence or are superior to those specified in Chapter V - Technical Requirements.
17. Documents Establishing the Qualifications and Experience of the Bidder	17.1. The Bidder shall fill all the required information in the forms mentioned in Chapter IV – Bid forms to establish the Bidder's qualifications and experience to perform the contract in accordance with Chapter III - Bid Evaluation Criteria. The Bidder shall prepare original documents for verification at the request of Employer. 17.2. Documentary evidence of the Bidder's capability to perform the contract, if awarded, shall comply with the BDS. 17.3. In case the bidding package has undergone pre-qualification, if there is any change in the bidder's capacity and experience between the time of pre-qualification and the submission of the Bid, the bidder shall update its capacity and experience accordingly

18. Effective period of Bids	18.1. The effective period of Bids, including Technical Proposal and Financial Proposal, shall not be shorter than period specified in the BDS. A Technical Proposal or Financial Proposal with a shorter effective period shall not be further evaluated. 18.2. Where it is necessary, prior to the expiration of the bid effective period, Employer may request bidders to extend the effective period of their bids (for both Technical and Financial Proposals. If a Bid Security is requested, it shall also be extended for a corresponding period (equivalent to the extended effective period plus 30 days). If a Bidder rejects such request, its Bid shall not be further considered and its Bid Security shall be returned. A Bidder accepting the request shall not change any content of its Bid. The request for extension and responses thereto shall be made in writing.
19. Bid Security	19.1. When taking part in a bidding process, the Bidder shall furnish a Bid Security before the bid closing time either in the form of a Bank Guarantee issued by a bank or credit institution lawfully operating in Viet Nam or by depositing a cheque as prescribed in ITB Item 19.2. Where a Bank Guarantee is used, it shall comply with Form No.04 (a) or Form No.04 (b) of Chapter VI – Bid forms or follow other forms provided that it contains all the essential contents of a bid security. In the event that the effective period of the bid is extended as prescribed in ITB Item 18.2, the Bid Security shall be also extended accordingly. If a joint venture makes a bid, it may provide the Bid Security following either of the two methods below: a) Each and every member of the joint venture shall provide its individual Bid Security provided that total value of Bid Security of all members is not lower than that mentioned in ITB Item 19.2; if the bid security of one member is determined as invalid, the Bid of the joint venture shall be further considered and evaluated. If any member of the joint venture violates the law, causing its bid security to be seized as prescribed in ITB Item 19.5, then the bid security of all members in joint venture shall be seized as a result.

b) If joint-venture members agree to let one member be responsible for the Bid Security of all members in joint venture, the Bid Security may then be in the name of the joint venture or the member in charge, provided that the total value is not lower than that mentioned in ITB Item 19.2. If any member in joint venture violates law, causing its bid security to be seized as prescribed in ITB Item 19.5, then the bid security for the whole joint venture shall be seized as a result.

19.2. Value, currency and effective period of the Bid Security shall be specified in the BDS. The validity period of the bid security shall be calculated from the bid closing date to the last day of validity of the bid security (the expiry of the bid security shall fall within such last day of validity without the necessity of covering the full 24 hours of that day

19.3. A Bid Security shall be considered invalid when it falls under any of the following circumstances: having a lower value or shorter effective period as required in ITB Item 19.2, Employer's name (beneficiary) displayed on the bid security being inaccurate, the original of bid security not being enclosed and bid security bearing invalid signature, or containing unfavorable conditions for Employer.

The bid security shall be deemed invalid in any of the following cases: it has a lower value or a shorter validity period than required under Clause 19.2 of the Bidding Data Sheet; it is not issued in the correct name of the beneficiary; it does not bear a valid signature (or valid digital signature in case of an electronic bid security); it is dated prior to the issuance of the Bidding Documents by the Employer; or it contains conditions unfavorable to the Employer (including failure to fully comply with the commitments specified in Form No. 04A and Form No. 04B, Section IV).

Where a bid security is issued in the form of a guarantee letter or an insurance guarantee certificate, such guarantee letter or insurance guarantee certificate must be signed and, if applicable, stamped by a lawful representative of a domestic credit institution or a branch of a foreign bank established under Vietnamese law, or by a domestic non-life insurance enterprise

	or a branch of a foreign non-life insurance enterprise established under Vietnamese law. 19.4. Unsuccessful bidders shall have their bid security either returned or released within the time period as prescribed in the BDS, counting from the date on which the notification of the Bidder selection is published. With regard to the successful Bidder, the Bid Security shall be returned or released after the Bidder undertakes Performance Security. 19.5. The Bid Security shall be seized under any of the following circumstances: a) The Bidder withdraws its bid after the bid closing time and during the effective period of bid; b) The bidder commits a violation under Article 16 of the Law on Bidding or violates the law on bidding resulting in bid cancellation; c) The bidder fails to provide the contract performance security as required under Article 68 of the Law on Bidding; d) The bidder fails to proceed with or refuses to negotiate the contract (if applicable) within 05 working days from the date of receipt of the Employer's invitation for contract negotiation, or has conducted the negotiation but refuses or fails to sign the minutes of contract negotiation, except in cases of force majeure; e) The bidder fails to proceed with or refuses to finalize the contract or framework agreement within 10 days from the date of receipt of the Employer's notice of bid award, except as provided in Clause 4, Article 34 of Decree No. 214/2025/ND-CP or in cases of force majeure.
20. Bid specifications and signature contained in bid	20.1. The Bidder shall prepare its bid including: 01 original of the Technical Proposal, 01 original of the Financial Proposal as described in ITB Item 11 and copies of the Technical Proposal and the Financial Proposal, in the number specified in the BDS. The cover letters of these dossiers shall be clearly marked "Original of the Technical Proposal", "Original of the Financial Proposal." "Copy of Technical Proposal", "Copy of the Financial Proposal".

	In case of modification, substitution of the Technical Proposal, the Financial Proposal, the bidder shall prepare 01 original and copies of these dossiers, in the number specified in the BDS. The cover letters of these dossiers shall be clearly marked “Original of modified Technical Proposal”, “Copy of Modified Technical Proposal”, “Original of Modified Financial Proposal”, “Copy of Modified Financial Proposal”, “Original of Substituted Technical Proposal”, “Copy of Substituted Technical Proposal”, “Original of Substituted Financial Proposal”, “Copy of Substituted Financial Proposal” In case there is Alternative Technical Proposal in accordance with ITB Item 13, Bidders shall prepare 01 original and copies of this dossier, in the number specified in the BDS. The cover letters of these dossiers shall be clearly marked “Original of Alternative Technical Proposal”, “Copy of Alternative Technical Proposal” 20.2. The Bidder shall be responsible for the consistency between the original and the copies. In the event of any discrepancy between the original and the copies which does not change the order of ranking of bidders, the original shall prevail. In the event of any discrepancy between the original and the copies which results in changing the order of ranking of bidders, the bid shall be rejected. 20.3. The original and all copies of the Technical Proposal and the Financial Proposal shall be typed or written in indelible ink, numbered pages in continuous order. The Submission letter, discount letter (if any), additional, clarification documents of bids, price schedules and other forms in Chapter IV- Bidding forms shall be signed by legal representative or a person duly authorized to sign on behalf of the Bidder and stamp (if any), in case of authorization, bidder shall have a power of attorney in accordance with Form No.02 Chapter IV - Bidding forms or a authenticated copy of company charter, branch establishment decision or other documents evidencing the authority of the authorized person and they shall be attached to the bid. 20.4. In case of a Joint Venture, the Bid shall be signed by the legal representative of all the members in the Joint Venture or
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	the representative member on behalf of the Joint Venture in accordance with the Joint Venture agreement. To be legally binding on all the members in the Joint Venture, the Joint Venture agreement shall be signed by legal representatives of all members in the Joint Venture 20.5. Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by person signing the bid.
21. Sealing and Marking of Bids	21.1. The Technical Proposal envelope shall contain the original and the copies and be clearly marked “TECHNICAL PROPOSAL”. The Financial Proposal envelope shall contain the original and the copies and be clearly marked “FINANCIAL PROPOSAL”. If the bidder modifies or replaces its Technical or Financial Proposal, the modified documents or substitutions (including the original and the copies) shall be put into separate envelopes, which shall be clearly marked “MODIFICATION OF TECHNICAL PROPOSAL”, “MODIFICATION OF FINANCIAL PROPOSAL”, “SUBSTITUTION OF TECHNICAL PROPOSAL”, or “SUBSTITUTION OF FINANCIAL PROPOSAL”, respectively. If the Bidder proposes an alternative Technical Solution, the whole proposed solution shall be separately put into an outer envelope with separate inner envelopes for technical proposal and financial proposal and the outer envelope shall be clearly marked “PROPOSAL OF ALTERNATIVE TECHNICAL SOLUTION”. Envelopes that contain Technical Proposal, Financial Proposal; modification of Technical Proposal, substitution of Technical Proposal, modification of Financial Proposal, substitution of Financial Proposal (if any); and proposals of Alternative Technical Solution (if any) shall be sealed. The sealing of envelopes shall be subject to the Bidder’s rules for sealing. 21.2. The envelopes shall: a) bear the name and address of the Bidder b) be addressed to The employer in accordance with ITB Item 22.1; c) bear the name of the Procurement Package in accordance with Item ITB 1.2;

	d) Bear a warning “Do not open prior to the time for opening of Technical Proposal” in accordance with ITB Item 32.1 for the envelopes of Technical Proposal, Modification or Substitution of Technical Proposal (if any); or “Do not open prior to the time for opening of the Financial Proposal” for the envelopes of Financial Proposal, Modification or Substitution of Financial Proposal (if any). 21.3. If the envelopes are not sealed or have their seals lost while being despatcher to Employer, or they are not marked as required in ITB Items 21.1. and 21.2, the Bidder shall bear all the consequences or disadvantages. Employer shall will assume no responsibility for the confidentiality of the bid if the Bidder fails to comply with above regulations.
22. Bid closing time	22.1 The bidder shall submit the bid either directly or by sending it to the address of the Employer, provided that it is received prior to the bid closing time as specified in the Bidding Data Sheet (BDS). The Employer shall accept bids from all bidders submitted before the bid closing time, including in cases where the bidder has not purchased or received the Bidding Documents from the Employer. In case the bidder has not purchased the Bidding Documents, the bidder must pay to the Employer an amount equal to the selling price of the Bidding Documents prior to the acceptance of its bid 22.2. The Employer may extend the bid closing time by amending the Bidding Documents in accordance with Clause 8 of the BDS. In the event of such extension, all obligations of the Employer and the bidders related to the previous bid closing time shall be adjusted to correspond to the new extended bid closing time
23. Late Bids	The employer shall not consider any bid that arrives after the deadline for submission of bids. Any bid received by The employer after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.
24. Withdrawal, Substitution, and Modification of Bids	24.1. A Bidder may withdraw, substitute, or modify its Bid after it has been submitted by sending a written notice, duly signed by a legal representative or an authorized representative, and shall include a copy of the Power of Attorney in accordance with ITB Item 20.3. The corresponding substitution or modification of the bid must accompany the respective written notice and

	must be: a) prepared and submitted in accordance with ITB Items 20 and 21, and in addition, the envelopes shall be clearly marked “MODIFICATION OF TECHNICAL PROPOSAL”, “MODIFICATION OF FINANCIAL PROPOSAL”, “SUBSTITUTION OF TECHNICAL PROPOSAL”, “SUBSTITUTION OF FINANCIAL PROPOSAL”, or “BID WITHDRAWAL”, respectively b) received by The employer prior to the deadline prescribed for submission of bids, in accordance with ITB Item 22. 24.2. Bids requested to be withdrawn in accordance with ITB Item 24.1 shall be returned unopened to the Bidders. 24.3. No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the effective period of bid specified by the Bidder on the Letter of Bid or any extension thereof.
25. Confidentiality	25.1. 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 such process until publication of the Contract Award. Under no circumstances, may information contained in a bid be revealed to (an)other bidder(s), except for information disclosed at the opening of Technical Proposals and Financial Proposals. 25.2. Except for cases of bid clarification prescribed in ITB Item 26 and the negotiation of contract, the Bidder is not permitted to contact to The employer, expert team on any matter related to its bid and the procurement from the time of opening technical proposal until the publication of bidder selection.
26. Clarification of Bids	26.1. After the opening of Technical Proposal and Financial Proposal, the Bidder is responsible for clarifying the Technical Proposal and Financial Proposal at the request of The employer . Any request for clarification of The employer and any response of the Bidder shall all be in writing. In the event that a Technical Proposal lacks documentary evidence establishing the Bidder’s eligibility, qualifications and experience (including the manufacturer’s license or partnership certificate or any other equivalent documents, if required by the Bidding Documents), Employer shall request the Bidder to clarify and supplement the bid with that documentary evidence of bidder eligibility, qualifications and experience. Regarding technical and financial proposals of the Bid, clarification shall not change the nature of

	Bidder, the substance of the bid and the bid price. The Bidder shall inform The employer in writing of receipt the request for bid clarification by any of the following means: in-person delivery, post, fax or email. 26.2. The bid clarification between the Bidder and Employer shall be in writing. 26.3. During period prescribed in the BDS, in the event that the bidder, on its own, detects that its bid lacks documentary evidence establishing the Bidder's eligibility, qualifications and experience (including the manufacturer's license to sell goods, or partnership certificate, or any other equivalent documents, if required by the Bidding Documents) in the Bidding Documents, the Bidder may, at its own initiative, send such clarification to Employer. Employer shall accept such clarification for consideration and evaluation; clarification documents on the Bidder's eligibility, qualifications and experience shall be an integral part of the Bid. Employer shall notify the Bidder in writing of receipt of clarification documents via any of the following ways: in-person delivery, post, fax or email. 26.4. The clarification of Bids shall be made between Employer and the concerned Bidder only. The contents of bid clarification shall be treated by Employer as an integral part of the Bid. Regarding clarification that directly affects the evaluation of the Bidder's eligibility, qualification and experience, technical requirements or financial requirements, if the deadline for clarification expires, but the Bidder fails to send any clarification or the clarification does not satisfy requirements of Employer, Employer shall evaluate the Bid based on documents submitted by the bidder prior to the bid closing time. 26.5. Where necessary, Employer may send a written request to a bidder who is likely to win the contract, asking the bidder to an in-person meeting with Employer for clarification of its bid. Such bid clarification shall be recorded in writing and shall ensure transparency and objectiveness. 26.6 The Bidder cannot clarify the Bid Submission on their own after the bid closing time. 26.7. In cases where the Bidding Documents require commitments, a contract of warranty, maintenance, but the Bid Submission does not include these documents, The employer shall request the contractor to clarify and supplement the Bid
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	Submission within an appropriate timeframe, but not less than 03 working days, as the basis for evaluating the Bid Submission.
27. Deviations, Reservations, and Omissions	During the evaluation of bids, the following definitions apply 27.1. “Deviation” means a departure from the requirements specified in the Bidding Documents; 27.2. “Reservation” means the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Documents; 27.3. “Omissions” means the failure to submit part or all of the information or documentation required in the Bidding Documents.
28. Determination of Responsiveness	28.1. Expert team shall determine a bid’s responsiveness as prescribed in ITB Item 11. 28.2. A substantially responsive bid means one that meets all the requirements of the Bidding Documents without material deviation, reservation, or omission. 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; or would limit in any substantial way and be inconsistent with the Bidding Documents, Employer's powers or the Bidder’s obligations under the Contract; or b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids. 28.3. Expert team shall examine all technical aspects of a bid submitted in accordance with ITB Items 16 and 17 in order to confirm that all the criteria prescribed in Part II – Technical Requirements have been met without any material deviation, reservation or omission. 28.4. If a bid is not substantially responsive to the requirements of the Bidding Documents, it shall be rejected and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.
29. Nonmaterial nonconformities	29.1. Provided that a bid is substantially responsive, Employer, Expert team may accept nonconformities in the bid that do not constitute a material deviation, reservation or omission. 29.2. Provided that a bid is substantially responsive, Employer, Expert team may request that the Bidder submit the necessary information or documentation, within a reasonable period of

	time, to rectify nonmaterial nonconformities in the bid related to documentation requirements. Requesting information and documentation on such nonconformities shall not be related to any aspect of the bid price. Failure of the Bidder to comply with the request may result in the rejection of its bid. 29.3. Provided that a bid is substantially responsive, Employer, Expert team shall make adjustment for nonmaterial, quantifiable nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or nonconforming item or component.
30. Subcontractor	30.1. The main contractor (Contractor) is entitled to enter into agreements with subcontractors mentioned in the list as prescribed in Form No. 15 (a) of Chapter IV – Bid forms. The use of subcontractors shall not give rise to a change in the responsibilities of the Contractor. The Contractor shall be responsible for quantity, quality, schedule and other responsibilities related to the portion(s) of work performed by the subcontractor(s). A subcontractor's qualifications and experience shall not be considered when the Contractor's bid is evaluated (except where the BD explicitly allows the use of special subcontractors). The Contractor itself must meet all qualification requirements (without consideration of qualifications and experience of subcontractors). If the Contractor, in its bid, neither proposes the use of subcontractor for any particular task or nor anticipates the portion(s) of work to be performed by subcontractors, it shall be construed that all the work under the procurement is to be performed by the Contractor. If any subcontractor is subsequently employed during performance of the contract, the Contractor shall be regarded as having committed the practice of "contract assignment" as prescribed in ITB Item 3. 30.2. The Contractor shall not use subcontractors for tasks other than those explicitly stated in the Bid to be performed by subcontractors; the replacement or addition of subcontractors into the list of subcontractors stated in the Bid shall only be in the presence of a good, legitimate reason and subject to Employer's consent; the use of subcontractors beyond the tasks stated in the Bid to be performed by subcontractors, or use of subcontractors not included in the list of subcontractors in the bid in the absence of Employer's consent shall be regarded as a practice of "contract assignment". 30.3. Employer may permit the Contractor to employ special subcontractor as prescribed in the BDS. The Contractor shall

	make a list of special subcontractors with their respective qualifications and work experience using form No.15 (b) of Chapter IV – Bid forms. Employer shall evaluate qualifications and experience of those special subcontractors according to the criteria prescribed in Section 2.3 Chapter III – Bid Evaluation Criteria. If the special subcontractor fails to meet requirements set forth in the BD and the Contractor’s qualifications and experience fail to respond to requirements set forth for the portion of work to be performed by the special contractor, the bid shall be considered as non-responsive. 30.4. In case a contractor commits bid assignment as prescribed in Clause 8 Article 16 of the Law on Bidding, it shall be handled in accordance with Point b Clause 1 Article 133 of Decree No. 214/2025/ND-CP
31.Preference in bidder Selection	31.1. Principles of Preferences: a) Where a bidder is entitled to more than one type of preference in the evaluation of capacity and experience or in the financial evaluation, only one preference most favorable to the bidder shall be applied for each corresponding evaluation content. b) Where all bidders are entitled to the same preference, or none of the bidders is entitled to preference, the preference shall not be applied for comparison and ranking. c) The bidder must provide evidence that the bidder, goods, or services offered are eligible for preference in accordance with Clause 1 Article 10 of the Law on Bidding. d) The bidder shall be entitled to preference when supplying goods for which the domestic production cost accounts for 30% or more. 31.2. For goods specified at Point i Clause 1 Article 10 of the Law on Bidding, the determination of preferential goods shall be made in accordance with the regulations of relevant sectoral legislation, and not in accordance with the provisions of Section 31.3 of the BDS. 31.3. Preferences shall be calculated during the bid evaluation process for the purpose of comparison and ranking: Goods shall be entitled to preference only if the bidder demonstrates that the domestic production cost accounts for at least 30% of the

	offered price of the goods. The determination of domestically produced goods in Viet Nam may be carried out using either the direct or indirect formula as follows: • Direct formula: $D (\%) = G^*/G \times 100\%$ • Indirect formula: $D (\%) = (G - C)/G \times 100\%$ Where: • G*: Domestic production cost • G: Offered price of the goods in the Bid, exclusive of taxes; for manufacturer bidders, G shall be the ex-works (EXW) price of the goods • C: Value of imported costs, excluding import-related taxes and fees • D: Percentage of domestic production cost of the goods. Where $D \geq 30\%$, the goods shall be entitled to preference in accordance with Articles 6, 7, 8, 9, 10, and 11 of Decree No. 214/2025/ND-CP. 31.4. The method of calculating preference shall be implemented in accordance with the BDS. 31.5. The bidder must declare information on goods eligible for preference using Forms No. 15A and 15B or 15C, Section IV, as a basis for consideration and evaluation of preferences. In case the bidder fails to declare, the goods shall be deemed ineligible for preference. Where the bidder declares preference using Forms No. 15A and 15B or 15C, Section IV, but fails to attach supporting documents, the Employer shall request clarification and supplementation of documents to evaluate the preference. Where bidders offer goods with the same code (if any), manufacturer, year of manufacture, and origin in Viet Nam, but some bidders declare preference while others do not, the Employer may allow the non-declaring bidders to provide clarification for the purpose of preference evaluation for such goods. 31.6. Where the goods offered by all bidders are not eligible for preference, no evaluation or determination of preference value shall be conducted. 31.7. The bidder must attach documents proving that the goods offered are eligible for preference. 31.8. Other preferences shall be applied as stipulated in the BDS
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32. Opening of Technical Proposals	32.1. Except for cases prescribed in ITB Items 23 and 24, Employer shall publicly open all the technical proposals received prior to the bid closing time and shall clearly read out therefrom such information as prescribed in ITB Item 32.3. The opening of technical proposal shall be held in public at the address, date and time specified in the BDS in the witness of the representatives of all the bidders participating the opening ceremony and representatives of related agencies and organizations. The opening of technical proposals shall be conducted regardless of the absence of any Bidder's representative. 32.2. First, envelopes marked "BID WITHDRAWAL" shall be opened and read out and the corresponding bids shall not be opened, but returned to the Bidders. Employer shall not accept a bid withdrawal and shall go ahead opening the technical proposal unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal. Next, envelopes marked "SUBSTITUTION OF TECHNICAL PROPOSAL" shall be opened and read out and shall replace the corresponding Technical Proposals being substituted. The substituted Technical Proposals shall not be opened but returned to the Bidders. No Technical Proposal substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution. For envelopes marked "MODIFICATION OF TECHNICAL PROPOSAL", the accompanying notice shall be opened and read out with the corresponding Bids. No modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification. Only bids that are opened and read out at the bid opening shall undergo further consideration. 32.3. The bid opening shall be conducted to every Technical Proposal or Substitution of Technical Proposal according to the alphabet order of the Bidders' names and shall follow the below procedures: a) Checking the seals and opening the envelopes marked "TECHNICAL PROPOSAL", "MODIFICATION OF TECHNICAL PROPOSAL" (if any) or "SUBSTITUTION TECHNICAL PROPOSAL" (if any); b) Opening the originals of technical proposals, modifications of technical proposals (if any), or substitutions of technical proposals (if any) and reading out loud at least the following information therefrom: the name of the Bidder, the effective
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	period of Technical Proposal, performance period stated in the Letter of Bid in the Technical Proposal, the value and effective period of the Bid Security and other details as Employer may consider appropriate. c) Reading out loud the number of copies of Technical Proposal and relevant information, including information on the proposed alternative technical solution of the Bidder (if any); d) The representative of The employer countersigning originals of Letter of Bid of Technical Proposal, Power of attorney (if any), Joint Venture Agreement (if any), and Bid Security. No Bid shall be rejected at Bid opening except for late bids, in accordance with ITB Item 23. e) The employer and bidders shall reach a consensus on how to seal the envelopes marked “FINANCIAL PROPOSAL”, “MODIFIED FINANCIAL PROPOSAL”, “SUBSTITUTE FINANCIAL PROPOSAL”. After sealing, Employer shall preserve such envelopes as confidential documents until Financial Proposals are opened as prescribed in ITB Item 34. 32.4. Employer shall prepare a record of the technical proposal opening that shall include the information prescribed in ITB Item 25.3. The record of technical proposal opening shall be countersigned by the representatives of Employer and the Bidders participating in the technical proposal opening. The lack of any signature of the Bidders in the record shall not render such record null and void. A copy of the record shall be distributed to all Bidders who participate in the technical proposal opening.
33. Evaluation of the Technical Proposal	33.1. Expert team shall apply criteria mentioned in this Section and the evaluation method prescribed in BDS to evaluate Technical Proposals and shall not be allowed to use any criterion or method other than the aforementioned. 33.2. Examination and evaluation of the validity of the Technical Proposals: a) The inspection and evaluation of the validity of the Technical Proposals shall comply with Section 1 of Chapter III - Bid Evaluation Criteria; b) Only those bidders having valid Technical Proposals are further considered for evaluation of qualifications and experience. 33.3. Evaluating qualifications and experience:

	a) The evaluation of Bidder's qualification and experience shall be conducted according to evaluation criteria specified in Section 2 of Chapter III - Bid Evaluation Criteria b) Only those bidders satisfying qualification and experience requirements are further considered for technical evaluation. 33.4. Technical evaluation: a) Technical evaluation shall be conducted according to evaluation criteria specified in Section 3 of Chapter III - Bid Evaluation Criteria; b) Only technically responsive bidders shall have their financial proposals considered and evaluated in accordance with Sections 4 and 5 of Chapter III - Bid Evaluation Criteria. 33.5. If the procurement is divided into independent lots as prescribed in ITB Item 14.5 and it is allowed to bid for individual lots, the evaluation of Technical Proposal shall comply with Section 7 of Chapter III - Bid Evaluation Criteria corresponding to the lot(s) in which the Bidder participates. 33.6. The list of technically responsive bidders shall be approved in writing. Expert team shall notify such list to all the participating bidders and invite technically responsive bidders for the opening of financial proposals with clear indication of time and place for opening of financial proposals.
34. Opening of Financial Proposal	34.1. The opening of financial proposals shall be conducted publicly at the address, date and time specified in the written notification of the list of technically responsive bidders in the witness of the representatives of all the bidders participating the opening ceremony and representatives of related agencies and organizations. The opening of financial proposals shall be conducted regardless of the absence of the representative any technically responsive bidder. 34.2. At the opening of financial proposals, Employer shall publicly show the written approval of the list of technically responsive bidders, and then check the seal of the envelopes marked "FINANCIAL PROPOSAL", "MODIFICATION OF FINANCIAL PROPOSAL", or "SUBSTITUTION OF FINANCIAL PROPOSAL". 34.3. If a bidder requests a substitution of its financial proposal, Employer shall open and read clearly out loud information on the envelope marked "SUBSTITUTION OF FINANCIAL PROPOSAL"; then the substitution shall replace the initial financial proposal. Substituted Financial Proposals shall not be

	opened but returned to the Bidders. No substitution of Financial Proposal shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution. For envelopes marked “MODIFICATION OF FINANCIAL PROPOSAL”, the accompanying notice shall be opened and read out with the corresponding Bids. No modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification. Only Financial Proposals that are opened and read out at the opening ceremony shall undergo further consideration and evaluation. 34.4. The opening procedures shall be conducted to every Financial Proposal in the alphabetical order of the Bidders’ names and shall follow the below steps: a) Opening the originals of financial proposals, modifications of technical proposals (if any), or substitutions of technical proposals (if any) and reading out loud at least the following information therefrom: the name of the Bidder, the bid price stated in the Letter of Bid in the Financial Proposal, the bid price indicated in the Price Schedule, discount (if any), the effective period of the Financial Proposal and other details as Employer may consider appropriate. Where the procurement package is divided into independent lots, Employer shall read the bid price and discount for each lot. Only discount information that is read in the opening ceremony is considered and evaluated; b) Reading out loud the number of copies of Financial Proposal and relevant information; c) The representative of The employer countersigning the original of Financial Proposal and letter of discount (if any). Employer shall not reject any Financial Proposal of the bidders listed in the list of technically responsive bidders at the opening of financial proposal; 34.5. Employer shall prepare a record of the financial proposal opening that shall include the information prescribed in ITB Items 34.2, 34.3, and 34.4. The record of financial proposal opening shall be countersigned by the representatives of Employer and the Bidders participating in the financial proposal opening. The lack of any signature of the Bidders in the record shall not render such record null and void. A copy of the record shall be distributed to all technically responsive Bidders.
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35. Evaluation of Financial Proposal and Ranking of Bidders	35.1. Expert team shall apply criteria mentioned in this Section and the evaluation method prescribed in BDS to evaluate Financial Proposals and shall not be allowed to use any criterion or method other than the aforementioned. 35.2. Examination and evaluation of the validity of Financial Proposals: a) The inspection and evaluation of the validity of the Financial Proposals shall comply with Section 4 of Chapter III - Bid Evaluation Criteria; b) Only those bidders having valid financial proposals are further considered for detailed evaluation of financial proposal and ranking of bidders. 35.3. Detailed evaluation of financial proposals and ranking of bidders: a) Detailed evaluation of financial proposals shall be conducted according to evaluation criteria specified in Section 4 of Chapter III - Bid Evaluation Criteria b) After detailed evaluation of financial proposals, Expert team shall prepare a ranking list of bidders and submit to Employer for approval. The first-ranked bidder shall be invited to enter into contract negotiation. The ranking of bidders shall be conducted according to the BDS. 35.4. If the procurement is divided into independent lots as prescribed in ITB Item 14.5, the financial proposal evaluation shall comply with Section 7 of Chapter III - Bid Evaluation Criteria corresponding to the lot(s) in which the Bidder participates.
36. Contract negotiation	36.1. Contract negotiation shall be carried out according to the provisions in BDS. 36.2. In cases where contract negotiation is applied, it must be based on the following: a) The Bid Evaluation Report; b) The Bid Submission and any documents clarifying the Bid Submission (if any) from the Bidder; c) The Bidding Documents, including the general conditions, specific conditions of the contract, and any documents clarifying or amending the Bidding Documents (if any). 36.3. Principles of contract negotiation: a) No negotiation shall be conducted on matters where the

	contractor's bid fully complies with the requirements of the Bidding Documents. b) The unit price determined in the financial evaluation stage must not be altered. 36.4. Content of contract negotiation: a) Issues that are not sufficiently detailed, unclear, or inconsistent between the Bidding Documents and the Bid Submission, or among different sections of the Bid Submission that could lead to disputes or affect the responsibilities of the parties during the contract implementation; b) Proposed changes or alternative technical solutions from the contractor if the Bidding Documents allow for the contractor to propose alternative technical solutions under ITB Item 13.1; c) Negotiation on key personnel: During negotiation, the bidder shall not replace key personnel (i.e. personnel proposed in the Bid or personnel already replaced once in accordance with Clause 2 Article 29 of Decree No. 214/2025/ND-CP), except where the evaluation of the Bid takes longer than expected in the procurement plan or in case of force majeure, which prevents the proposed key personnel from participating in the contract implementation. In such cases, the bidder may replace the personnel provided that the substitute has equivalent or higher qualifications, experience, and capability, and the bidder shall not change the bid price. d) Negotiation on arising issues during the contractor selection process (if any) to finalize the detailed contents of the package; e) Negotiation on minor errors as specified in ITB Item 29; f) Negotiation on taxes in cases where Section 13.5 of the BDS requires the bidder to submit prices using Form No. 12.2 (12.2A, 12.2B, or 12.2C), Section IV. During negotiations, the specific taxes payable by the bidder under tax law must be clearly identified, including import-related taxes, fees, and charges, special consumption tax (if any), VAT, and other tax obligations. The applicable tax rates and the tax amounts payable by the bidder must be explicitly stated in the contract. g) Negotiation on price in cases where the proposed winning bid price exceeds the approved package price under the technical-based evaluation method, serving as a basis for contract award consideration in accordance with Article 61 of the Law on Bidding. h) Negotiation on other necessary matters.
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	36.5. During contract negotiation, the parties involved shall finalize the draft contract document, specific contract conditions, and the contract appendices, including detailed lists of the scope of supply, price schedules, and supply timelines. 36.6. If the negotiation fails, the bid solicitor shall report to the investor for consideration and decision to invite the next-ranked contractor for negotiation. If the negotiations with the next-ranked contractors also fail, the bid solicitor shall report to the investor for consideration and decision to cancel the bidding in accordance with in ITB Item 41.1(a). 33.7. In case, due to objective reasons or force majeure, the bidder is unable to conduct direct contract negotiations with the Employer, the Employer may consider conducting the negotiations online.
37. Conditions for being recommended for contract award	A bidder is recommended for contract award when it meets the following conditions: 37.1. The bidder has a valid bid; 37.2. It has the required qualifications and experience in accordance with Section 2 of Chapter III - Bid Evaluation Criteria; 37.3. It has a responsive technical proposal as prescribed in Section 3 of Chapter III - Bid Evaluation Criteria; 37.4. The deficiency is not more than 10% of the bid price; 37.5. The bidder meets requirements as prescribed in the BDS; 37.6. The recommended award price (including taxes, fees and charges (if any)) does not exceed the approved procurement value. If the cost estimate of the approved procurement is different from the approved procurement value, the former estimate shall serve as the basis for considering contract award.
38. Publishing bidder selection result	38.1. The Investor shall post the notice of contractor selection results on the Viet Nam National E-Procurement System, enclosing the bid evaluation report within 05 working days from the date of approval of the contractor selection results. The content of the notice of contractor selection results is as follows: a) Information on the bidding package: - Notice of Invitation for Bids (No.); - Name of the bidding package; - Approved package price or estimate (if any); - Name of the Employer; - Method of contractor selection; - Type of contract;

	- Time for performance of the bidding package. b) Information on the winning bidder: - Tax identification number; - Name of the bidder; - Bid price; - Bid price after discount (if any); - Technical score (if any); - Evaluated price (if any); - Winning bid price; - Time for performance of the bidding package; - Contract duration. c) For each category of goods or equipment in the bidding package, the Employer must disclose the following information: - Name of goods; - Capacity; - Features, technical specifications; model code, trademark; - Origin; - Winning unit price. d) List of unsuccessful bidders and a summary of the reasons for each bidder's rejection. 38.2. In case there is a request for a specific explanation on why a contractor was not selected, the contractor shall submit a request on the System or directly meet the Investor. The Investor is responsible for responding to the contractor's request within 02 working days from the date of receiving the request. 38.3. In case of bid cancellation as stipulated in point a, ITB Item 40.1, the notice of contractor selection results and on the System must clearly state the reason for the bid cancellation.
39. Change in quantity of Goods and Services	At the time of contract award, the Employer shall have the right to increase or decrease the quantities of goods and services specified in Section IV, provided that such adjustment does not exceed the percentage stipulated in the E-BDS and does not entail any change in the unit prices or other terms and conditions of the Bid or the Bidding Documents. The variation in quantities shall not exceed ten percent (10%)
40. Letter of Bid Acceptance and Contract Award	Together with the notification of bidder selection result, Employer shall send a Notification of Bid Acceptance and Contract Award, including requirements pertaining to performance security, time frame for contract finalization and

	conclusion of contract, using Form No. 21 of Part IV – Contract Forms, to the successful bidder, provided that the Bidder has been verified as being capable to perform the Contract satisfactorily. The Letter of Bid Acceptance and Contract Award shall be an integral of the Contract documents. In the event that the successful bidder fails to finalize and conclude the contract or pay Performance Security before the deadline mentioned in the Letter of Bid Acceptance and Contract Award, such bidder shall be rejected and its Bid Security shall be seized as prescribed in Point e ITB Item 19.5
41. Bidding cancellation	41.1. Employer shall notify cancellation of the bidding under any of the following circumstances: a) All Bids fail to meet requirements mentioned in the Bidding Documents; b) Changes to the objectives or scope of investment in the approved investment decision for a project, or changes to the objectives or scope of procurement in the approved procurement estimate due to the reorganization of administrative units, restructuring of state agencies, or other force majeure circumstances that lead to changes in the volume of work or evaluation criteria specified in the Bidding Documents c) Bidding Documents fail to comply with law on bidding or other regulations of relevant law provisions, thus the selected bidder fails to meet requirements for fulfilling the procurement package or the project. d) Any organization or individual, other than the successful bidder, that commits a prohibited act as prescribed in Article 16 of the Law on Bidding, resulting in a distortion of the contractor selection result. e) Cancellation of the bidding process in accordance with Clause 5, Article 42 of the Law on Bidding. 41.2. Any organization or individual who violates law on bidding, resulting in the bidding cancellation (as prescribed in Point c, Point d and Point e of ITB Item 41.1) must compensate the costs incurred for all related parties and shall be sanctioned in accordance with law. 41.3. In case of bid cancellation under this Section, within 05 working days the Employer shall return or release the bid security to the bidder who has submitted the original bid security, except where the bidder commits a violation leading to

	the non-return of the bid security value as prescribed in Clause 9 Article 14 of the Law on Procurement
42. Conditions for contract signing	42.1. The Bid of the Bidder remains effective at the time of contract signing. 42.2. At the time of signing of contract, the selected Bidder must meet requirements of technical and financial capabilities for performing the contract. If the Bidder, in reality, no longer meets substantially the requirements of qualifications and experience as prescribed in the Bidding Documents, Employer shall refuse to conclude the contract with the Bidder. Then, Employer shall cancel the decision on approval for bidder selection result, the Letter of Bid Acceptance and Contract Award and shall invite the next-ranked bidder for contract negotiations. 42.3. Employer shall make sure that funding arrangements for advance and payment as well as other essential arrangements are put in place for executing the procurement package on schedule.
43. Performance Security	43.1. Before the effective date of the contract, the successful bidder shall furnish a Performance Security either in the form of a Bank Guarantee issued by a bank or a credit institution lawfully operating in Viet Nam or by depositing a cheque as prescribed in SCC Article 6. If a Bank Guarantee is used, the Bidder shall use either Form No. 23 of Part IV - Contract Forms or another form approved by Employer. 43.2. The Bidder shall not have its Performance Security returned in any of the following cases: a) It refuses to perform the contract when the contract comes into effect. b) It violates the covenants in the contract; c) It delivers the contract behind the schedule and refuses to extend the effective period of performance Security.
44. Handling complaints in bidding	41.1. For bidding packages under the scope of application of the Law on Procurement: a) Where their lawful rights and interests are deemed to be affected, bidders, agencies, or organizations may lodge petitions to the Petition Handling Council, the Competent Person, or the Employer to review issues arising during the contractor selection process or the contractor selection result, in accordance with

	Article 89 of the Law on Procurement and Articles 137, 138, and 139 of Decree No. 214/2025/ND-CP. b) In case of petition to the Employer, the bidder, agency, or organization shall submit the petition directly on the System. In case of petition to the Petition Handling Council or the Competent Person, the bidder shall submit the petition to the address specified in the Bidding Data Sheet (BDS). 41.2. For contractor selection activities prescribed at Point d, Clause 7, Article 3 of the Law on Procurement, or contractor selection activities not falling under the scope of application of the Law on Procurement, the settlement of petitions shall be carried out in accordance with the BDS.
45. Monitoring and supervising the bidder selection process	Upon detection of any act or content that is inconsistent with legislation on bidding, the Bidder shall notify the organization or individual in charge of monitoring and supervising the bidder selection process as prescribed in the BDS.

CHAPTER II: BID DATA SHEET (BDS)

ITB 1.1	Name of Employer: VNPT Net Corporation.
ITB 1.2	Name of the procurement package: Engineering, Supply, and Installation of HSS System Equipment Name of the project: HSS System Capacity Enhancement. The quantity and ID numbers of the lots pertaining to the procurement package: This procurement package has only one (01) lot.
ITB 1.3	The contract performance period is 365 days (three hundred sixty) and warranty period of 24 months.
ITB 2	The source of funds (method for financing arrangement): Equity of Viet Nam Post and Telecommunications Group (VNPT)
ITB 4.1 (c)	Assurance of competition in bidding shall be prescribed as follows: - The Participating Bidders do not have shareholding or equity contribution representing more than 30% of: VNPT Net Corporation, No. 30 Pham Hung Street, Tu Liem Ward, Ha Noi City, Viet Nam; The employer : VNPT Net Corporation, No. 30 Pham Hung Street, Tu Liem Ward, Ha Noi City, Viet Nam. except for the cases where: (i) The Bidder is a subsidiary or member company of a state-owned group or corporation, with main business activities matching the nature of the group or corporation's package; (ii) The contractor is a parent company, subsidiary, or member company within an economic group or state-owned corporation, and the products or services of the package fall under the main business activities of the group or corporation, and this package belongs to a subsidiary or member company. The participating Bidders must not hold shares or contribute capital with consulting contractors; must not have joint shares or capital contributions exceeding 20% with any organization or individual for each of the following parties: + Design consultant: Not applicable; + Valuation consultant: Not applicable; + Supervision and contract implementation inspection consultant: not applicable;

	+ Bidding Documents preparation consultant: Not applicable; + Bidding Documents appraisal consultant: Not applicable; + Bid Submission evaluation consultant: Not applicable; + Consultant for contractor selection result appraisal: Not applicable; + Project management and contract management consultant, other consultants whose services are directly related to the package: Not applicable. - The Participating Bidders must not belong to the same agency or organization directly managing the consulting contractors (as mentioned above). - The Participating Bidders must not belong to the same agency or organization directly managing the Investor or Bid Solicitor, except for cases where the contractor is a public service unit under a state management agency with functions and assigned tasks appropriate to the nature of the package of that state management agency. - Government administrative organizations and enterprises with the same directly managing agency or capital contributions when participating in each other's packages do not have to meet the requirements of legal and financial independence between the contractor and the Investor, Employer. The shareholding and capital contribution ratio between the parties is determined at the time of bid closing and according to percentage stated in the enterprise registration certificate, establishment decision, or other equivalent documents. In case a contractor participates as a joint venture or a consulting contractor is selected as a joint venture, the capital ownership ratio of other organizations or individuals in the joint venture is determined by the following formula: $\text{Capital ownership ratio} = \sum_{i=1}^n X_i \times Y_i$ Where:
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	Xi: Capital ownership ratio of other organizations or individuals in joint venture member i; Yi: Percentage (%) of the work volume of joint venture member i in the joint venture agreement; n: Number of joint venture members. A domestic bidder falling under the case prescribed in Point g, Clause 1, Article 10 of the Law on Bidding, when offering products manufactured by such bidder, shall not be required to comply with the competition requirements set forth under this Section.
ITB 4.4	Not Applicable.
ITB 4.5	Regarding foreign bidders: If a foreign bidder wishes to make a bid, it is required to enter into a joint venture with a domestic bidder or employ a domestic subcontractor. If the Bidder decides to employ subcontractors, the expected tasks may be specified in the Bid without specifying the names of subcontractors¹; the Bidder shall submit, together with its bid, a commitment to employ Vietnamese subcontractors in case of successful bidding.
ITB 5.3	Documentary evidence establishing the validity of Goods: ✓ The Bidders shall provide: - Technical documents explaining the technical solution to the goods and technical specifications of the genuine goods (Brochure or Catalog) specifying the technical characteristics and quality of the product line provided project from the factory to demonstrate the criteria stated in the design file and technical instructions, the document must be verified on the Website. - Detailed technical documentation of the goods supplied by the manufacturer; * In case the Bidders is not a manufacturer, the Bidders must provide the original of Authorize letter's the manufacturer for the goods or the certificate of Joint Venture or other equivalent document. In this Authorize letter, the manufacturer must commit to provide goods, direct support in the delivery, as well as warranty policy, specific support after sales.

¹ The bidder is not required to have agreement or contract with the subcontractor when participating in the bidding

	✓ Documents evidencing percentage of domestic production costs (original or notarized) certified by the competent state agency (for goods eligible for preferential treatment under prescribed in Section 31, Chapter I). ✓ The Contractor shall provide all the following documents (The time which the Bidder must provide each type of documents is mentioned in the Chapter VII. Special Conditions of Contract): - User manual (in Vietnamese and English): + Pictures or drawings (if any); + Diagram of operation principle (if any); + Detailed technical documentation of the goods supplied by the manufacturer + Guide: installation, commissioning, operation, maintenance ... - Certificate of Origin (C/O). - Certificate of Quality (CQ); - All goods and equipment should be permitted to be imported & circulated in to Viet Nam;
ITB 7.1	The request for clarification of BD must reach Employer not later than five (05) working days before the day of bid closing time. For <u>Clarification of bid purposes</u> only, The employer 's address is: <i>VNPT-NET Corporation (VNPT-Net)</i> <i>Address: 30 Pham Hung St., Tu Liem Ward, Ha Noi, Viet Nam</i> <i>Attention: Mr. Nguyen Anh Duc, Director of PMU I - VNPT Net.</i> <i>Telephone: +84.24.3787.7777</i> <i>Facsimile number: +84.4.3787.6600</i>
ITB 8.3	Employer shall send the Amendment of Bidding Documents to all bidders who have received the Bidding Documents from Employer before the day of bid closing time for at least 10 days. Where the time for sending the Amendment of Bidding Documents fails to meet the above requirements, Employer shall extend the corresponding deadline for the submission of bids.

ITB 10	Bids as well as correspondence and documents related to bids as exchanged between bidder and Employer shall be written in English. Supporting materials and documents of the bid may be written in another language, along with a translation into English or Vietnamese. Where the translation is not provided, The employer may, as it finds necessary, request the Bidder to supplement.
ITB 11.4	The Bidder shall submit the following documents with its Bid: The bid shall include: 1. Bidder shall provide the notarized/authenticated copy of one of the following documents: the valid establishment, business registration license issued by the competent agency in the respective jurisdiction where the bidder operates. In case of necessity, the foreign Bidders (or foreign member of Joint Venture) shall provide the notarized/authenticated and consular legalized copy of one of above documents as required by VNPT. 2. Executive Summary: describe all essential parts of the Bid; 3. Technical Proposal, including: - Proposed Product Descriptions (technical and functional) for the offered goods, services...based on Part II. Technical Requirements; - Table of Supplying of offered goods, services...with quantity, description of detail items (i.e. Bill of Quantity without prices) based on Part II. Technical Requirements; - Other required documents for proof the compliance of technical requirements. - Period of contract execution (Time schedule) based on Part II - Technical Requirements; - Documents for proving the validity of import costs of locally produced/processed goods and services as a basis for determining preferences. - For Statement of Compliance: The Bidder shall state his degree of compliance and make reference (if any) in relation to all requirements set forth by VNPT in the following contents: + Statement of Compliance to meet the requirements of providing Post-warranty technical support service (Form No 18.3);

	+ Statement of Compliance to meet the requirements Chapter I - Instructions to Bidders and Chapter II - Bidding Data Sheet, Part I and Bid Evaluation Criteria as specified in Chapter III, Part I (Form No 18.4); + Statement of Compliance to meet the requirements of Scope of supplying specified in Part II (Form No 18.5); + Statement of Compliance to meet the requirements of General Conditions of Contract, Specific Conditions of Contract and Contract Form as specified in Part III (Form No 18.6); + Statement of Compliance to meet the requirements of Technical requirement specified in Part II (Form No 18.7); + Statement of Compliance Certificate of Origin; + Statement of Compliance of the Bidder commit to supply goods on schedule, according to technical requirements and with sufficient relevant documents; + Statement of Compliance of the Bidder commit to receive goods in case the goods are installed or put into operation but do not meet the technical requirements stated in the bidding documents, the contractor is responsible for receiving the goods and must bear all reimbursement of expenses. related fees to the Investment owner. 4. Financial Proposal, including: - Price Schedules with detail unit prices for each item, each component constituting cards, sub-racks, racks, ... (as detail on ITB 14.2) - Post-Warranty Technical support service Quotation (optional for one year) as specified in Chapter IV, Bidding Forms with scope of work in compliance with Technical requirements. ⚠ If Bidder's Technical and Financial Proposals do not include one of the documents as specified above, the Bid shall be considered ineligible and rejected. ⚠ For each item, the Bidder shall respond in writing down as follows: ➤ FC (Full Compliance) means the Bidder fully meets the requirements specified in the item without any deviations or exceptions. ➤ PC (Partial Compliance) means the Bidder partially meets the requirements specified in the item.
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	➤ NC (Non-Compliance) means the Bidder is unable to meet the requirements specified in the item. Note: The Bidder must explain the deviations or the exceptions or the effects that will have on overall performance of the offered equipment/service.
ITB 13.1	The Bidder is not allowed to propose Alternative Technical Solution.
ITB 14.2	Prices shall be quoted as specified in each Price Schedule included in Chapter IV, Bidding Forms. Other format shall be not considered. The price which is broken down of price components is required solely for the purpose of facilitating the comparison of bid by VNPT-Net. All items quoted in the BoQ must have unit price and unit price of each item must be unique within the BoQ. The unit price must be applied for the next system expansion contract. Employer has the right to buy, not limited quantity any item in the quotation of bid. Bidder shall be fully responsible for installation, installation supervision, commissioning, integration and project management. Pricing for all the items shall be clearly shown in Bidder's quotation. All necessary hardware, licensed software/features, accessories and related services, required for installation/commission as a basis of the offered system shall be included in Bidder's Bid Price and detailed in Bidder's Bill of Quantity (BoQ). The C/O of system (HW, SW) supplied in this procurement package must be detailed in the Bill of Quantities (BoQ) for each item. If the price in the BoQ have "Total discount", the Bidder shall clearly express discount content and method toward each item in BoQ. If the discount method is unclear, pricing discount means even proportion discount for every item of BoQ. All prices shall be expressly stated. The bill of quantity/list and price list shall enable VNPT to identify the total price for the System of the quoted package which is compliant to the Part II. Technical Requirements. For the pricing schedule, Bidder shall consider the Insurance requirement as follow: Bidder will bear the risk, loss, damage to and will maintain appropriate insurance in relation to the Hardware, Firmware, Software, Documentation and Spare Parts until the date of Provisional Acceptance Certificate (PAC), Prices shall be entered in the following manner: 1. For Goods to be imported:

	i. The price of the Goods quoted DAP at Project Sites, in accordance with INCOTERMS 2010 issued by ICC which include all taxes, charges, fees which will be payable on the Goods and Services (e.g. FCWT, VAT...) (These taxes, charges, fees must be listed separately as specified in Chapter IV, Bidding Forms) if the contract is awarded to the Bidder and the price for transportation, insurance, and other local services (e.g. storage, unloading, unpacking, ...) required to convey the Goods to Project Sites. Business Income Tax of the Foreign Contractor Tax is defined in accordance to the Circular No 103/2014/TT-BTC, dated 06/8/2014 and all local duty, fee in Viet Nam. Total amount of tax will be deducted by Employer in payment. ii. For Related Services, other than transportation and other services required to convey the Goods to Project site (installation sites), whenever such as survey, design, installation, commissioning, testing, and the insurance to the date of PAC: the price of each item comprising the Related Services and any applicable taxes. 2. For Locally manufactured or Already imported Goods: The price of the Goods is the already quoted price in Viet Nam (price for Goods to be conveyed to Project Sites including all taxes, charges, fees (if any) which must be listed separately as specified in Chapter IV, Bidding Forms and inland transportation, all kinds of insurance to the date of PAC, warranty of 24 months and other local services). 3. All items quoted in the BoQ must have unit price and each item must have unique unit price within the BoQ. 4. Bidder shall be fully responsible for survey, design, installing, testing, commissioning and project management. Pricing for all the items shall be clearly shown in Bidder's quotation. 5. The C/O of system (HW, SW) supplied in this procurement package must be detailed in the Bill of Quantities (BoQ) for each item. 6. If Bidder offers discount value, Bidder shall clearly express discount content and method toward each item in BoQ. If the discount method is unclear, pricing discount means even proportion discount for every item of BoQ. 7. In case, the Bidder don't put or don't put enough for the Business Income Tax value of the Bidder into the Price Summary schedule, it means the tax value of Bidder has already included in the total price. Total amount of tax will be deducted by Employer in payment.
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	8. All prices shall be expressly stated. The bill of quantity/list and price list shall enable VNPT to identify the total price for the System of the quoted package which is compliant to the Part II. Technical Requirements. 9. For the produced/processed goods or internationally produced/processed goods, which have been imported and offered for sale in Viet Nam, the Bidder offers as specified in Form No.17 (a1.1), Chapter IV - Bidding forms, including all taxes, fees and charges (if any). 10. For the produced/processed goods or internationally produced/processed goods, local Bidder (if any) offers the price on the basis delivery to warehouse of Employer. This price is including all tax, fees and charges (if any) as specified in Form No.17 (a2.1), Chapter IV - Bidding forms. 11. For related services, the Bidder offers as specified in Form No.17 (b.1), Chapter IV - Bidding forms, including all taxes, fees and charges (if any).
ITB 14.5	The lots of the procurement package: This package has only one lot.
ITB 15	The currencies of the bid are: Vietnamese Dong (VND) and/or United State Dollar (USD). Other currency will not be accepted. Only one currency must be quoted for one category of work, costs arising inside Viet Nam must be quoted in VND, cost arising outside Viet Nam quoted in United State Dollar (USD). For evaluation and comparison purposes, the currency(ies) of Bid used to convert all various currencies into a single currency (equivalent currency), which is VND. The exchange rate for conversion shall be the selling exchange rate announced by Joint Stock Commercial Bank for Foreign Trade of Viet Nam (Vietcombank) on the date of Bid opening.
ITB 16.3	Period of time the Goods are expected to be functioning (for the purpose of spare parts): 5 years. (after warranty)
ITB 17.2	Documentary evidence of the Bidder's capability to perform the contract if its bid is accepted contains: - In case The Bidders is not manufacturer, the Bidder must show the Authorized letter of the manufacturer or Certificate of Joint Venture or Equivalent document for the main offered goods. In case the bid is not enclosed with such document, the Bidder must

	be responsible to clarify and supplement in the process of evaluating the bid. The Bidders are being awarded the contract only after having submitted to the Authorized letter of the manufacturer or Certificate of Joint Venture or equivalent document. - Provide all documents to prove that the Bidders have enough key human resources required in Clause 2.2, Section 2, Chapter III of the bidding documents. - Goods (Software and Hardware) supplied for this procurement package shall be committed to the legal rights and complied with the rules of intellectual property law and the international treaties to which Viet Nam is a member. - The Bidder shall ensure the intellectual property right for all offered equipment (including hardware and software). Bidder shall have following written commitments: -The bidder shall ensure that he does not have any activities that affect the safety of telecom infrastructure in supplying telecom equipment in the world and in Viet Nam; - The bidder shall ensure that, in case of bid winning, the telecom equipments which are supplied by the bidder do not affect the safety of telecom infrastructure; -If the competent authorities detect telecom equipment supplied by the bidder affecting the safety of telecom infrastructure, the bidder shall be fully responsible and must pay compensation for any damage related.
ITB 18.1	The effective period of bid (technical proposal and financial proposal) shall be: ≥ 180 days from the day of bid closing time.
ITB 19.2	Contents of the Bid Security: - Value and currency of the Bid Security: 155.000 USD or equivalent 4.087.000.000 VND. Bid security is required in the template of a guarantee letter. The guarantee letter must be signed by legal representative of the banks or branch of a foreign bank established according to Viet Nam regulations. - The effective period of the Bid Security shall be: 210 days from the day of bid closing time.

ITB 19.4	The unsuccessful bidders shall have their bid security either returned or released within 14 days from the date on which the results of bidder selection are notified.
ITB 20.1	Number of Technical Proposal, Financial Proposal is: 01 original and 01 copy (each copy contains 01 USB which stores data of the bid. Data files must be in two types of format: *.doc/*.xls and *.pdf). In case of modification, substitution of the Technical Proposal, the Financial Proposal or having alternative technical proposal, the Bidders shall submit copies of the dossiers of modified, substituted, alternative technical proposal with quantities equal to number of copies of Technical Proposal, Financial Proposal.
ITB 22.1	For bid submission purposes, The employer 's address is: VNPT Net Corporation. Recipient: VNPT Net Corporation. - The building number/ the floor / room number: VNPT Net Tower. - The street name: 30 Pham Hung St., Tu Liem Ward. - City: Ha Noi. - Postal code: 10000 - The country: Viet Nam. Bid closing time is: As per the bidding invitation announcement at https://muasamcong.mpi.gov.vn
ITB 26.3	The Bidder may, at its own initiative, send bid clarification documents to The employer within: 03 calendar days from the day of Bid closing time.
ITB 30.3	Special subcontractor: Not permitted.
ITB 31.4	Preferences method: a. Preference for goods with Vietnamese origin which have Percentage of Goods' local cost of production below 50% and no goods with Percentage of Goods' local cost of production of 50% or more as follow: For method of evaluated price, goods which are not subject to margin of preference shall be added an additional amount of 7.5% of the

	quoted price after deduction of discounts of these goods (if any) to the Bidder's evaluated price for comparison and ranking. When bidders offer goods of Vietnamese origin with Percentage of Goods' local cost of production below 50% and the production facility has at least 50% of workers, employees who are disabled, war veterans, or ethnic minorities with a valid labor contract which has duration of 3 months or more at the time of bid closing, such bidders are entitled to a preferential margin of 10 % instead of 7.5%. b. Preference for goods with Vietnamese origin which have Percentage of Goods' local cost of production of 50% or more as follow: For method of evaluated price, goods which are not subject to margin of preference shall be added an additional amount of 10% of the quoted price after deduction of discounts of this goods (if any) to the Bidder's evaluated price for comparison and ranking; goods which are subject to margin of preference with Percentage of Goods' local cost of production below 50% shall be added an additional amount of 2.5% of the quoted price after deduction of discounts of this goods (if any) to the Bidder's evaluated price for comparison and ranking; goods with Vietnamese origin which have Percentage of Goods' local cost of production below 50% and production facility has at least 50% of workers, employees who are disabled, war veterans, or ethnic minorities with a valid labor contract which has duration of 3 months or more and at the time of bid closing shall not be added any additional amount to evaluated price for comparison and ranking; In case goods subject to incentives have a domestic production cost ratio of less than 50%, the formula specified in Point c, Clause 1, Article 6 of Decree No. 214/2025/ND-CP will apply; Goods originating in Viet Nam have a domestic production cost ratio of less than 50% and the production facility has at least 50% of its employees being disabled, war invalids, or ethnic minorities with long-term labor contracts. If the contract is implemented for 3 months or more and at the time of bid closing, the contract is still valid, the incentive coefficient is 10%. When bidders offer goods of Vietnamese origin with Percentage of Goods' local cost of production of 50% or more and the production facility has at least 50% of workers, employees who are disabled, war veterans, or ethnic minorities with a valid labor contract which has duration of 3 months or more and at the time of bid closing, such bidders are entitled to a preferential margin of 12 % instead of 10%.
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	3. Innovative products with Vietnamese origin are entitled to preferences as follow: For method of evaluated price, goods which are not subject to margin of preference shall be added an additional amount of 15% of the quoted price after deduction of discounts of this goods (if any) to the Bidder's evaluated price for comparison and ranking; goods which are subject to margin of preference with Percentage of Goods' local cost of production below 50% shall be added an additional amount of 7.5% of the quoted price after deduction of discounts of this goods (if any) to the Bidder's evaluated price for comparison and ranking; goods which are subject to margin of preference with Percentage of Goods' local cost of production below 50% shall be added an additional amount of 5% of the quoted price after deduction of discounts of this goods (if any) to the Bidder's evaluated price for comparison and ranking; For goods that are not innovative products of Vietnamese origin, in case the bidder offers goods of Vietnamese origin with Percentage of Goods' local cost of production below 50%, when calculating preferences, the margin of 15% is replaced by 7.5%; For goods of Vietnamese origin with Percentage of Goods' local cost of production of 50% or more, when calculating preferences, the margin of 15% is replaced by 10%. 4. Innovative products are eligible for incentives as prescribed in Point 3 of this Clause when they meet one of the following conditions: - Products in the list of high-tech products prioritized for investment and development or the list of high-tech products encouraged for development according to the Prime Minister's decision. - Products formed from scientific and technological results of science and technology enterprises according to the provisions of law on science and technology enterprises. - Products created based on inventions, semiconductor integrated circuit layout designs, and plant varieties of the contractor are granted protection certificates for a period of no more than 05 years from the date of grant or program. the contractor's own computer for a period of no more than 05 years from the date of issuance of the copyright registration certificate. - Semiconductor chip products.
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	- The product won the Ho Chi Minh Award, the state award for science and technology according to the provisions of law on science and technology awards. - New products created from research and development results at one of the facilities of the National Innovation Center. - New products created from the results of scientific research and technological development according to the provisions of law on technology transfer. Innovative products specified in this Clause are entitled to incentives for a period of 6 years from the first time they are produced and are eligible to be brought to the market.
ITB 32.1	Technical Proposal shall be opened in public: Within 01 hour from the Bid closing time, at address as below: - The building number/ the floor/ room number: VNPT Net Tower. - The street name: 30 Pham Hung St., Tu Liem Ward. - City: Ha Noi. - Country: Viet Nam.
ITB 33.1	Method for evaluating Technical Proposals: a) Qualification and experience evaluation: Using “pass/not pass” criteria; b) Technical evaluation: scoring against 1.000 scores.
ITB 35.1	Financial evaluation: Lowest evaluated bid selection. The error correction and adjustment of deviation shall be implemented in accordance with Note (1), Note (2), Article 5, Chapter III of BD and Article 31, Decree No. 214/2025/ND-CP .
ITB 35.3 (b)	Ranking of bidders: The bidder having the lowest evaluated bid price shall be ranked the first.
ITB 37.5	Any Bidder whose Evaluated Bid price is lowest
ITB 38.1	Time limit for sending notification of results of bidder selection shall be: 05 working days, from the date on which the bidder selection result is approved by Employer.
ITB 39	- Maximum rate of quantity increase: 10%;

	- Maximum rate of quantity decrease: 10%.
ITB 44	- Petition documents (if any) shall be sent to address of Investment Owner's Representative: VNPT Net Corporation – VNPT Net Tower, 30 Pham Hung St., Tu Liem Ward, Ha Noi. Tel: + 84 24 37877777 Fax: + 84 24 37876600 - Petition documents (if any) shall be sent to address of Competent person: VNPT Net Corporation – VNPT Net Tower, 30 Pham Hung St., Tu Liem Ward, Ha Noi.
ITB 45	Address of the organization or individual in charge of monitoring and supervising the procurement package: Not applicable.

CHAPTER III. BID EVALUATION CRITERIA

Section 1. Examination and evaluation of validity of Technical Proposals

1. Examining the validity of Technical Proposal:

- a) Check the number of originals and copies of the Technical Proposal;
- b) Check the composition of the original Technical Proposal, which includes: Letter of Bid, joint venture agreement (if any), power of attorney to sign the Letter of Bid (if any); Bid Security; documentary evidence of Bidder's qualification and experience; technical proposal and other components of the Technical Proposal as prescribed in ITB Item 11.1;
- c) Check the consistency between the original and its copies to serve the detailed evaluation of the Technical Proposal.

2. Evaluating validity of a Technical Proposal:

A Technical Proposal is considered valid when all of the conditions below are satisfied:

- a) There is an original of the Technical Proposal;
- b) There is a Letter of Bid of the Technical Proposal, which is signed and stamped (if any) by the legal representative of the Bidder. Regarding joint venture, the Letter of Bid shall be signed and stamped (if any) by legal representative of each and every joint venture member or signed by the lead member of the joint venture in accordance with the joint venture agreement;
- c) The contract duration mentioned in the Letter of Bid shall conform to the technical proposal and the Bidding Documents;
- d) The effective period of the Technical Proposal satisfies requirements as prescribed in ITB Item 18.1;
- dd) There is a Bid Security with a value and effective period that satisfies the requirements set forth in ITB Item 19.2. If the Bid Security is required in the form of a Bank Guarantee, the Bank Guarantee shall be signed by legal representative of the credit institution or branch of a foreign bank established under Viet Nam laws and regulations with the value, effective period and name of The employer (the beneficiary) as prescribed in ITB Item 19.2. If the Bid Security is required in the form of a deposited cheque, The employer shall manage the cheque as prescribed in ITB Items 19.4 and 19.5;
- e) The Bidder shall not have its name included in multiple Technical Proposal as a primary Bidder (a single bidder or a joint venture member) for the same procurement. In case the procurement is divided into independent lots, the Bidder shall not have its name included in multiple Technical Proposal as a primary Bidder for the same lot;
- g) The joint venture agreement shall be signed and stamped (if any) by the legal representative of each joint venture member, and specify detailed tasks and value thereof

performed by each joint venture member using the form No. 03 of Chapter IV – Bid forms;

h) The Bidder meets eligibility requirements as prescribed in ITB Item 4.

Those bidders having valid Technical Proposals shall be further considered for evaluation of qualification and experience.

Section 2. Evaluation criteria for qualifications and experience

The qualification and experience of a joint venture shall be total of those of all joint venture members, provided that each member is qualified and experienced to perform their tasks in the joint venture; if any member fails to meet qualification and experience requirements, the whole joint venture shall be considered not qualified. Where the procurement package is divided into independent lots, the Bidder's qualification shall be evaluated in proportion to the lot for which it makes a bid.

The subcontractors' qualification shall not be considered when the Bid of the primary Bidder is evaluated (unless the use of special subcontractor is permitted by Bidding documents). The primary Bidder is required to satisfy all qualification criteria (regardless of the subcontractor's qualification and experience).

Where pre-qualification has taken place, upon submission of bid, the bidder shall have to update its qualifications and experience if these have changed as compared to the information declared in its submitted pre-qualification documents; if there is no change in qualifications and experience, the bidder shall undertake in writing about its responsiveness to requirements for performing the procurement package.

Where pre-qualification is not applied, the Bidder's qualification and experience shall be evaluated as below. A bidder satisfying all criteria is considered qualified, and shall be evaluated as pass.

In case of the currency mentioned in similar contracts or payment confirmations of the Investor for completed goods supply contracts or tax declarations or related documents proving the contractor's capacity and experience are not in USD, when preparing the bids, the contractor must convert them to USD as the basis for evaluating the bids. The conversion shall be based on the selling exchange rate of Vietcombank on the date of signing the similar contract.

In the event that the contractor is a parent company (e.g., a Holding Company) that mobilizes its subsidiary to carry out a portion of the work in the package, the contractor must specifically disclose the portion of work assigned subsidiaries to the using Form No.15C in Chapter IV. The evaluation of the experience in performing similar contracts shall be based on the value and volume of work performed by both the parent company and subsidiary in the package.

2.1. Evaluation criteria for qualification and experience:

Bidder qualification and experience shall be evaluated by using the Table of Qualification Criteria below

TABLE OF QUALIFICATION CRITERIA

Criterion		Requirements need be compliant			Required Documents
No	Description	Requirement	Single bidder	Joint Venture bidder All members combined	
1	History of contract non-performance due to contractor's fault	From January 01, 2023 until the bid closing date, the contractor has not had two (02) or more contracts (for the supply of goods, EPC, EP, PC, or turnkey contracts) that were not completed due to the contractor's fault ⁽³⁾	Must meet the requirement (M)	Not applicable	Form No.06
2	Fulfillment of tax declaration and tax payment obligations	Having fulfilled tax declaration and tax payment obligations ⁽⁴⁾ for the most recent fiscal year prior to the bid closing date.	Must meet the requirement (M)	Not applicable	Commitments in the Letter of Bid
3	Financial situation and capabilities				
3.1	Financial performance	The Bidder's net worth calculated as the difference between total assets and total liabilities within the last fiscal year promptly before the bid submission deadline should be positive. (Net Worth = Total Assets – Total Liabilities)	Must meet the requirement (M)	Not applicable	Form No.09

Criterion		Requirements need be compliant			Required Documents
No	Description	Requirement	Single bidder	Joint Venture bidder All members combined Each venture member	
3.2	Annual Average Turnover (exclusive of VAT)	The Bidder's minimum annual average turnover (exclusive of VAT) within 03 ⁽⁵⁾ fiscal year(s) promptly prior to the bid submission deadline is worth 7.050.000 USD ⁽⁶⁾ .	Must meet the requirement (M)	Must meet the requirement (M)	Form No.09
4	Experience in performing contracts for the supply of similar goods	The Bidder has completed at least 01 similar Contract in the role of the Prime Contractor (whether Single Entity or Joint Venture Partner) or Subcontractor ⁽⁷⁾ within a time period from January 1, 2023 ⁽⁸⁾ to the bid submission deadline. The similar Contract mentioned above is defined as: - similar in specification to the other: 85.17.xx.xx, 84.71.xx.xx ⁽⁹⁾ , - Completed and having the minimum size (value) of 2.585.000 USD ⁽¹⁰⁾ .	Must meet the requirement (M)	Must meet the requirement (equivalent in proportion to the assigned portion of work)	Form No.08

Criterion			Requirements need be compliant			Required Documents
No	Description	Requirement	Single bidder	Joint Venture bidder		
				All members combined	Each venture member	
5	Capabilities of care, servicing, maintenance, overhaul, repair, furnishing of replacement spare parts or supply of other after-sale services ⁽¹¹⁾	The Bidder shall provide the proof of its capabilities of carrying out maintenance, repair, replacement spare part stocking or other after-sale service obligations in one of the following manners: - The Bidder must guarantee that it is independently capable of carrying out maintenance, repair, spare part stocking or other after-sale service obligations as per BD requirements. - The Bidder must sign an Agreement-in-principle with a unit having full capabilities of carrying out maintenance, repair, spare part stocking or other after-sale service obligations according to BD requirements.	Must meet requirement (M)	Must meet requirement (M)	Not applicable (M)	The Bidder's Undertaking or Agreement-in-principle

M: Mandatory

N/A: Not applicable

Note:

(3) Non-performance shall include all contracts:

- where non-performance was decided by the Investor, and was not challenged by the Bidder;
- where non-performance was decided by the Investor and, despite being challenged by the Arbitration or Court against that Bidder.

Non-performing Contracts shall not include the Contracts where the Investor's decision was overruled by the dispute resolution mechanism. Non-performance must be based on all information on disputes or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted. The Contracts that are slow in making progress through the Bidder's fault, but still completed, shall not be deemed as non-performing.

(4) The contractor shall provide documentation evidencing the fulfillment of tax declaration and corporate income tax payment obligations (personal income tax in the case of a contractor being a household business) for the most recent fiscal year prior to the bid closing date (in cases where the e-procurement system has not yet updated information on tax payment obligations) for verification when requested to present supporting documents. The obligations of tax declaration and tax payment must be fulfilled prior to the bid closing date.

Tax payment obligations refer to the payment of taxes in an amount corresponding to the applicable tax rate, taxable income, and taxable revenue declared by the contractor on the electronic tax system (i.e., the amount of tax paid corresponds to the amount of tax payable). In cases where late payment, tax exemption or reduction is granted under State policies, compliance shall be in accordance with such regulations.

Where information on the contractor's tax payment obligations is not automatically available on the system, the contractor shall submit the following documents:

- Tax declaration form (or tax payment notice issued by the tax authority for household businesses) and the tax payment receipt certified by the tax authority, printed from the electronic tax system; or
- Tax declaration form (or tax payment notice issued by the tax authority for household businesses) and a written confirmation from the tax authority regarding the fulfillment of tax obligations.

(5) Insert the time period required, which is usually 03 or 05 years prior to the year consisting of the bid submission deadline (An example of how to determine the time period required for the Average Annual Turnover (exclusive of VAT) within the last 3 fiscal years prior to the bid submission deadline is as follows: If the bid submission deadline falls in November 2022, the Bidder is required to submit the financial statements of the years 2019, 2020 and 2021).

If the Bidder's number of foundation years is less than the number of years required by BD, the former shall be used for calculation of the Average Annual Turnover (excluding VAT). If the Bidder's Average Annual Turnover (excluding VAT) falls within the value range defined subject to BD requirements, the Bidder continues to be qualified for further evaluation.

(6) The common methodology of calculation of the Average Annual Turnover (exclusive of VAT):

a) Where period of execution of the Contract (or Contract term) is 12 months or more, it will be calculated as follows:

Minimum Requirement of Average Annual Turnover (not including VAT) = [(Contract Price – VAT)/Years of Contract Execution] x k. Normally, the value of the factor k used in this formula ranges from 1.5 to 2.

b) Where period of execution of the Contract (or Contract term) is less than 12 months, it will be calculated as follows:

Minimum Average Annual Turnover Requirement (not including VAT) = [(Contract Price – VAT) x k. Normally, the value of the factor k used in this formula is defined as 1.5.

(7) For the Contracts in which the Bidder participates as a Joint Venture partner or a Subcontractor, only part of the work executed by the Bidder shall be calculated.

(8) Insert the time period required, which is usually 03 - 05 years prior to the year comprising the bid submission deadline.
Example: From January 1, 2018 to the bid submission deadline.

(9) Goods of a similar nature are goods that meet one of the following two criteria: (i) Criterion 1: Goods belonging to the same field or category (the investor specifies the field or category, such as medical equipment, electrical equipment, office equipment, etc.), or (ii) Criterion 2: Goods having the same Chapter Code or Group Code (corresponding to the first 4 digits of the code set) in the Harmonized Commodity Description and Coding System (HS) issued by the World Customs Organization (WCO) (referred to as the HS code). The HS code is based on Circular No. 31/2022/TT-BTC dated June 8, 2022, of the Ministry of Finance (published by the General Department of Customs on its website: <https://www.customs.gov.vn>). Suppliers providing goods of the same field or category as required by Bidding Documents (HSMT) or with the same first four digits of the HS code are considered to be of a similar nature to the goods in the package.

For example: If the goods in the package are laptops with an HS code of 84.71.30.20, then goods with an HS code of 84.71.xx.xx are considered to be of a similar nature. In cases where the goods in the package have not yet been assigned an HS code, the supplier must declare contracts for goods in the same field or category as required by HSMT (Criterion 1).

(10) Size of similar Contract:

In the case where a bidding package includes multiple goods items, the corresponding value of each goods item must be stated as a basis for evaluating the bidder's experience in executing similar supply contracts.

Where the bidding package comprises different types of goods, depending on the nature and scale of the package, the Employer or

Expert Team shall specify requirements regarding the scale of similarity either based on the main goods of the package (clearly identifying the main goods) or based on all types of goods in the package, indicating the required scale for each main goods item or each goods item. For centralized procurement or procurement of goods with large quantities or volumes in the tender, the requirement for the scale of similar contracts may be adjusted downward to $Y/1.25$ and/or the package may be divided into lots to increase competitiveness. Here, Y is usually about 50% of the value of the bidding package under consideration. For packages with several goods items sharing the same Chapter code or Group code, the determination of similar contract scale shall follow points (iii) and (iv) of this note.

For procurement packages where the quantity of goods or workload is based on multi-year requirements and the execution period exceeds one year, the Bidding Documents shall specify the value of a similar contract for one cycle (one year) without requiring evaluation based on the total number of years.

Example: A package supplying materials X for the Employer's needs during 2024–2025 (from 01/01/2024 to 31/12/2025) has a contract value of VND 100,000,000,000 (for the two-year requirement). The required value of a similar contract is: $50\% \times 100,000,000,000 \div 2 = \text{VND } 25,000,000,000$.

The evaluation of the scale of similar contracts shall be based on completed and accepted values as follows:

- (i) There is at least one contract completed providing all types of similar goods with a value meeting a minimum of Y (or $Y/1.25$ for centralized procurement or procurement of goods with large quantities or volumes), where each similar item in the contract does not need to meet 50% (or 40% in the case of centralized procurement or large-scale goods) of the corresponding item value in the package; or
- (ii) There are similar goods items executed under different contracts (completed or ongoing, not yet accepted or liquidated) or under one incomplete contract, ensuring that the value of each executed similar goods item meets at least 50% of the corresponding goods item value in the package under consideration (or 40% in the case of centralized procurement or large-scale goods), without aggregating values of similar goods items from multiple contracts to form a single similar goods item exceeding 50% (or 40%) of the package item value.

Notes:

Executed goods items include partial or entire quantities accepted within the specified period, regardless of Contract Effective Date. The point of confirmation is the acceptance date of goods, not the contract date.

A completed contract is a contract where all goods have been accepted or the contract has been liquidated. The confirmation date

is the acceptance date, not the signing date.

For a bidder who is both a manufacturer and supplier (some goods or part of the goods offered are produced by the bidder, while others are purchased from third-party suppliers), in addition to declaring experience in similar contracts, the bidder must declare production capacity as specified in Section 4, Table 02 of this Chapter. Evaluation is based on the supply contract for similar goods (corresponding to goods purchased from third-party suppliers) and the bidder's production capacity (corresponding to goods self-produced).

For centralized procurement packages using supplier capability selection, the similar contract is determined according to the quantity and value of goods the bidder offers, ensuring each executed similar goods item meets at least 50% of the value of the item offered (or 40% in centralized or large-scale procurement).

For packages where certain goods items share the same Chapter or Group code (code A), the evaluation of similar contract scale based on completed and accepted value is as follows:

- (iii) At least one completed contract providing all types of similar goods with a value meeting at least K (or K/1.25 for centralized/large-scale procurement), where K equals 50% of the total value of items without the same Chapter or Group code (not code A) plus the highest value among items sharing code A (based on approved contract or estimate); or
- (iv) Similar goods items executed under different contracts (completed or ongoing, not yet accepted or liquidated) or under one incomplete contract, ensuring each executed similar goods item without code A meets at least 50% of the corresponding item value in the package (or 40% in centralized/large-scale procurement). For items with the same code A, the executed similar goods item only needs to meet at least 50% of the highest item value with code A in the package (or 40%). Values of similar goods items from multiple contracts must not be aggregated to exceed 50% (or 40%) of the package item value.

(11) In case the bidder lacks the required commitment, such commitment may be supplemented during the bid evaluation process. If the bidder fails to provide the required commitment within a reasonable period as requested by the Employer, the bidder's proposal shall be deemed non-compliant with the requirements on warranty capability, supply of spare parts, or provision of other after-sales services and shall be rejected. Where after-sales services are not required, this evaluation criterion shall be disregarded.

2.2. Evaluation criteria for key specialists

In the list of contracted specialists dedicated to deploy this procurement package, bidder shall have at least 04 specialists specialized in installing, dimensioning, operating, maintaining HSS system dedicated to deploy this project meet following requirements:

No	Position	Specialists Number	Experience in similar work	Certifications/Professional qualifications
1	Project manager	1	Minimum 5 years or Minimum 1 contract	Bachelor degree or equivalent
2	HSS specialists	3	Minimum 2 years or Minimum 1 contract	Bachelor degree and certificate from HSS/Mobile Core Network manufacturers/ Or Bachelor degree from IT or telecom or Cloud infrastructure

Bidders shall submit proposed key specialists detailed information and experience documents as follow Form No No.12, No.13 and No.14 Chapter IV – Bidding Forms.

Bidders shall submit the copy of specialist contracts; the contracts shall be validated at the bid closing time.

2.3. Special subcontractor (if any):

Not applicable.

Section 3. Technical Evaluation Criteria

3.1. Evaluation principles:

The Bidder shall state its degree of compliance in relation to all requirements set forth by VNPT in Part II/CHAPTER V-TECHNICAL REQUIREMENTS.

For each item, the Bidder shall respond in writing down as follows:

- ✓ “Fully Compliant” (FC) means the Bidder fully meets the requirements specified in the item without any deviations or exceptions. Bidder shall get maximum score if evaluated fully-meet-the-requirements, get 50% of the maximum score if evaluated meet 50% to <100% requirement, or get score 0 if evaluated be-unable-to-meet-requirement or meet 0% to <50% requirements.
- ✓ “Non-Compliant” (NC) means the Bidder is unable to meet the requirements specified in the item. Bidder shall get zero (0) for this item.
- ✓ “Partially Compliant” (PC): For the requirement Bidder states “PC”, Bidder will have to point out reason (or reasons) and explanation for his partial compliance, and at the same time, give out suggested options/alternatives for the issue of his partial compliance. If Bidder’s explanation is proper and accepted by VNPT Net,

Bidder shall be considered to get score for this item, otherwise Bidder shall get zero (0) for this item. The Bidder shall get 50% of max score if their commodity is partial compliant (meet requirement from 50% to < 100%) with corresponding item's requirements. The Bidder states NC for one part of one requirement, it means NC for the whole of that requirement.

For technical requirements of BD, the Bidder must clearly explain technical solution for each compliance statement (if any).

The Bidders shall be evaluated in the tables of detail score. And the Bidder shall be evaluated as technically satisfactory and eligible for the financial evaluation if instructions in the SECTION1, CHAPTER V are fully complied and the following criteria are concurrently met:

- The total score is not less than 850;
- And the score must be equal or higher than the minimum score in all items, sections and requirements.

3.2. Details of Technical evaluation:

THE SUMMARY TABLE OF DETAIL SCORE

Items	Requirements	MAX Scores	MIN Scores	Note
	Total	1000	850	
SECTION 1	SCOPE AND SCHEDULE SUPPLYING	400	355	
1	INSTRUCTIONS	0	0	INF
2	SCOPE OF SUPPLY REQUIREMENTS	400	355	
SECTION2	TECHNICAL REQUIREMENT	561	453	
A.	GENERAL REQUIREMENTS	83	67	
I	General requirements	10	10	
II	General requirements for HLR HSS	73	57	
B	HLR/HSS REQUIREMENTS	262	215	
C	INFRASTRUCTURE REQUIREMENTS (*)	216	171	
I	GENERAL REQUIREMENTS	14	10	
II	HARDWARE REQUIREMENTS	71	55	
III	Network Function Virtualization Infrastructure Requirements	131	103	
IV	Cloud Native Requirements	131	103	
SECTION 3	OTHER REQUIREMENTS	39	39	
A	General Condition of Contract (GCC) and Special Conditions of Contract	28	28	
B	Contract form - Contract Agreement	10	10	
C	APPENDIX 2: TIME SCHEDULE	1	1	

(*) If the proposed system contains both NFVI and Cloud native solution, the total scores for the Item C Infrastructure Requirement in Section 2 shall be the scores of Item I General requirement + the scores of Item II HARDWARE REQUIREMENTS + (the scores of Item III NFVI Requirements + the scores of Item IV Cloud Native Requirements)/2.

(The Tables of detail score'll be found in Part II: Technical Requirements)

Section 4. Examination and evaluation of validity of Financial Proposals

4.1. Examining the validity of Financial Proposal:

- a) Check quantity of copies of Financial Proposal;
- b) Check composition of the original Financial Proposal, including: Letter of Bid of Financial Proposal; Summary Table of Bid Price and other documents of Financial Proposal as prescribed in ITB Item 11.2;
- c) Check the consistency between the original and copies to serve the detailed evaluation of Financial Proposal.

4.2. Evaluating the validity of Financial Proposal:

A Financial Proposal is considered valid when all of the conditions below are satisfied:

- a) There is any original of Financial Proposal;
- b) There is a Letter of Bid of Financial Proposal bearing the signature and stamp (if any) of the legal representative of the Bidder. Regarding joint venture, Letter of Bid shall be signed and sealed (if any) of the legal representative of each and every joint venture member or signed by the lead of the joint venture in accordance with the joint venture agreement;
- c) The Bid Price mentioned in the Letter of Bid must be stated in a fixed, specific amount, both in number and words, and be consistent with the total Bid Price mentioned in the Summary Table of Bid Price. The bidder shall not propose multiple bid prices or any unfavorable conditions to Employer or The employer ;
- d) The effective period of Financial Proposal satisfies requirements as prescribed in ITB Item 18.1.
- e) Including other components of Financial Proposal as specified in BDS-ITB 11.4.

Those bidders whose Financial Proposals are determined as valid shall be further considered for detailed financial evaluation.

❖ Bid will not be examined if fails to meet one of the pre-requisites below:

- 1. In each item, Bidder is requested to offer detailed descriptions including: manufacturer, country of origin, product code, quantity, unit price, total price, etc.
- 2. In the process of offering price of bidders:
 - + After discount (if any), the unit price of spare part must not be higher than unit price of main equipment in Bid quotation list.

+ After discount (if any), the items have the same commodity code (Item code or product code or Part number ...) must have the same unit price.

+ After discount (if any), the items with the same functionality and capability (hardware or software or features ...) must have the same unit price.

3. The Bid shall be required to propose a detailed price to every card functionality.

4. VNPT/VNPT Net has the right to buy the whole or a part of equipment with unlimited quantity for other projects of VNPT (if any) with the unit price after discount of this Bid.

5. Currency of Bid:

+ All of equipment and related services supplied from abroad must be quoted by US Dollar (USD).

+ All of equipment and related services supplied from inside Viet Nam territory must be quoted by Vietnamese Dong (VND).

Bidder who submits eligible Financial Proposal shall be subject to detail evaluation of Financial Proposal.

4.3. DETAILED EVALUATION CRITERIA OF FINANCIAL PROPOSAL

The Lowest-evaluated bid method includes following steps:

Step 1. Determine bid price (The comparison and ranking of Bids shall be conducted on the basis of bid prices excluding taxes, fees and charges related to importation, excise tax (if any), and value-added tax (VAT));

Step 2. Correct errors (comply with the Note (1));

Step 3. Adjust deviation (comply with the Note (2));

Step 4. Determination of bid price after error correction and deviation, discounts (if any);

Step 5. Converting of Bid price into common currency (if any);

Step 6. Determine evaluated price:

The evaluated price shall be determined by the formula below:

$$G_{DG} = G \pm \Delta_G + (\Delta_{UD})$$

Where:

- G = (bid price $\pm$ error correction value $\pm$ adjustment of deviation value) - discounts (if any), converting to a common currency (if any);

- Δ_G means value of factors converted to the same basis of lifecycle costing, including:

+ Technical Support.

- Δ_{UD} means an extra value given to an entity not eligible for preference as prescribed in ITB Item 31.

Step 7. Rank bidders

The Bid having the lowest evaluated price (G_{DG}) shall be ranked the first and the bidder shall be invited to negotiate:

S/Q	Description	Note
1	Bid price	Bid price excluding taxes, fees and charges related to importation, excise tax (if any), and value-added tax (VAT)
2	Error Correction	Note (1)
3	Adjustment of deviation	Note (2)
4	Bid price after Error Correction, Adjustment of deviation	
5	Converting to a common currency (if any);	
6	Determining the evaluation bid price: $G_{DG} = G \pm \Delta_G + \Delta_{UD}$ In which: * G = (Bid price $\pm$ value of errors $\pm$ value of deviations) - value of discounts (if any). * Δ_G denotes value of elements embedded on the same level for the life circle of goods. Δ_G is Adjusted prices to set up a common ground of evaluation. There are some adjustments prices as follows: Δ_G -Technical Support: Δ_G = Net Present Value <i>Technical Support Service Price for 01 year after warranty period (Detail at Form No. 18.2) - Chapter IV)</i> $\Delta_G = PV = \frac{F}{(1 + k)^3}$ - F: Payable of technical support at the year after warranty period - PV: Price (Net Present Value) for post-warranty Technical support at the year after warranty period. - k: Periodical interest rate of present amount	

	$k = 7\% \text{ per year}$ (The Bidder is required to list all items as shown in Form No. 18.2 in Chapter IV) * Δ_{UD} Denotes the added value for those who are not granted bid preferences according to indicated in ITB Item 31.	
7	Evaluation price	Total of (5)+(6)

Note:

(1) Error correction

Provided that the bid is substantially responsive, the arithmetical errors and other errors shall be corrected on the following basis:

a) Arithmetical errors include errors due to incorrect addition, subtraction, multiplication and division when calculating bid 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 an obvious misplacement of the decimal point in the unit price (10 times, 100 times, 1,000 times), the total price shall prevail and the unit price shall be corrected.

In case the Bidder insert no value or insert “0” in the columns “unit price” and “total price”, the Bidder shall be considered allocating the price of this work item to another work item of the procurement, the Bidder shall be responsible for performing these work items in conformity with the Bidding Documents’ requirements without any payment from the Employer during the contract performance.

b) Other errors:

- If a total price is fully filled but the equivalent unit price is left blank, the unit price shall be determined by dividing the total price by the quantity; if a unit price is fully filled but the equivalent total price is left blank, the total price shall be determined by multiplying the unit price and the quantity; if a unit price and the equivalent total are fully filled but the equivalent quantity is left blank, the quantity shall be determined by dividing the total price by the unit price. If the additional quantity determined above is different from the equivalent quantity mentioned in the Bidding Documents, such discrepancy shall be the deviation related to Scope of Supply which shall be adjusted as prescribed in the Step 3;

- Physical unit errors: correct units in conformity with the Bidding Documents’ requirements;

- Unit errors: replace “.” (stop) with “,” (comma) and vice versa in conformity with the Vietnamese unit. If The employer believes that the stops and commas in the unit price are put in wrong position, the total amount shall prevail and the unit bid 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 figures, the amount in words shall prevail, and the amount in figures shall be corrected. If the amount in words is erroneous, the amount in figures after correction as prescribed in this Section shall prevail.

(2) Adjustment of deviation:

a) If there is a deviation from Scope of Supply, the deficiency shall be added and the redundancy shall be subtracted according to the equivalent unit price in the Bid;

If there is a deficiency (deficiency in work item(s) in comparison with the supply requirements) without a equivalent unit price in the Bid, the deficiency shall be adjusted as follows:

The highest unit prices of work items in deficiency of the Bids satisfying technical evaluation shall prevail for adjustment of deviation; if the Bids satisfying technical evaluation having no equivalent unit prices, the unit prices of the approved estimates of the procurement shall prevail; if there is no estimate of the procurement, the unit price constituting the price of procurement shall prevail.

If there is only one bidder passing the technical evaluation, its equivalent unit price shall be prevail for adjustment of deviation; if the Bid has no equivalent unit price, the unit price of the approved estimates of the procurement shall prevail; if there is no estimate of the procurement, the unit price constituting the price of procurement shall prevail.

b) If the Bidder has a Letter of Discount, the correction and adjustment of deviation shall be carried according to the bid price without subtracting the discount. The rate of deficiency shall be determined according to the ratio of deficiency to bid price mentioned in the Letter of Bid.

CHAPTER IV: BID FORMS

A. BIDDING FORMS OF TECHNICAL PROPOSAL

Form No.01: Letter of BID

LETTER OF BID (Of Technical proposal)

Date: [insert signing date (as day, month and year)]

Name of procurement package: [insert name of procurement package according to notice of Invitation for Bid]

To: [*insert the complete and accurate name of The employer*]

After carefully studying the Bidding Documents, we:

Bidder's Name: ____ [write the contractor's name], business registration number: ____ [write the registration number according to the business registration], commits to perform the procurement package ____ [write the name of procurement package], number of notice of invitation for bids ____ [write the number according to the notice of invitation for bid], with contract term is ____ [*insert period of time for performing all tasks required in the procurement package*] in accordance with the requirements stated in the Bidding Documents.

The Validity of bid: The validity of this s shall be for ____ (1) days from the date of ____ [write the date, month, and year] (2).

Bid Guarantee: ____ [write the value in numbers, words, and currency of the bid guarantee].

Validity of Bid Guarantee: ____ [write the validity period from the bid submission date].

We commit that:

1. Not being in the process of liquidation or having our Business Registration Certificate or Certificate of Business Household Registration revoked or any equivalent documents; not being unable to pay debts as stipulated by the enterprise laws;
2. Not violating the provisions of competition guarantee in the bidding;
3. Not being under the ban on participating in bidding in accordance with the bidding law;
4. Not engaging in any corrupt, bribery, collusion, obstruction, and other acts of violation of bidding laws when participating in this bid package;
5. Providing truthful informations in the Bid;
6. In the event of winning the bid, the Bid and any bid clarification supplementary, shall constitute a legally binding agreement between the two parties until the contract is signed;

7. If our Bid is accepted, we will implement measures to ensure the contract performance as specified in ITB Item 43;
8. In the event that we do not submit the original bid guarantee as required by the Inviting Entity in accordance with ITB Item 19.1, we will be named on the System and our account will be locked for a period of 06 months from the date the Department of Procurement Management, Ministry of Planning and Investment receives the request of the Investor.

Form No.02: Power of Attorney
POWER OF ATTORNEY ⁽¹⁾

[Insert location and date]_____

I am _____[insert name, ID/passport number, position of bidder's legal representative], the legal representative of _____ [insert name of bidder] at _____ [insert address of bidder] hereby authorizes _____ [insert name, ID/passport number, position of authorized person] to perform the following tasks during the participation in the process of bidding for _____ [insert name of the procurement] of _____ [insert name of the project] held by _____ [insert name of The employer]:

[- Sign the Letter of Bids of Technical Proposal and Financial Proposal;

- Sign the Joint venture agreement (if any);

- Sign documents in communication with The employer during the bidding process, including the request for Clarification of Bidding Documents and Bids; sign requests for bid withdrawal, modification or substitution of Technical Proposal or Financial Proposal;

- Participate in contract negotiation and conclusion;

- Sign complaint letter (if any);

- Sign contract with Employer if the bidder is successful] (2).

The authorized person only performs the tasks within the scope of authorization of a legal representative of _____ [insert name of bidder]. _____ [insert name of bidder's legal representative] is totally responsible for the tasks performed by _____ [name of authorized person] within the authorization scope.

The Power of Attorney is effective from _____ [insert date] to _____ [insert date] ⁽³⁾ and is made into _____ copies with equal authentic value. _____ copies are kept by the authorizer, and _____ copies are kept by the authorized person.

Authorized person

Authorizer

[Full name, position, signature and stamp (if any)]

[Full name, position, signature and stamp of the legal representative]

Notes:

(1) The original of the Power of Attorney shall be sent to The employer together with the Letter of Bid as prescribed in Section 20.3 – Instructions to Bidder. The Bidder's legal representative may authorize their deputies, subordinates, directors of branches, and heads of representative offices of the Bidder to perform the tasks on behalf of the Bidder. The authorized person may use the seal of the Bidder or their seal. The authorized person may not authorize another person.

(2) The scope of authorization shall include one or multiple tasks above.

(3) Insert the effective date and expiration date of the Power of Attorney in conformity with the bidding process.

JOINT VENTURE AGREEMENT ⁽¹⁾

[Insert location and date] _____

Procurement: _____ [insert name of the procurement package]

Project's name: _____ [insert the project's name]

Pursuant to⁽²⁾ _____ [Law No 22/2023/QH15 dated 23/6/2023; Law No 57/2024/QH15 dated 29/11/2024; Law No 90/2025/QH15 dated 25/6/2025];

Pursuant to⁽²⁾ _____ [Decree No 214/2025/ND-CP dated 04/8/2025 issued by the Government making detailed provisions for implementation of the Law on Bidding for selection Bidder];

In response to Bidding Documents for _____ [insert name of procurement package] dated _____ [insert date written on the Bidding Documents];

Representatives of signatories to the joint venture agreement include:

Name of joint venture member _____ [insert name of each joint venture member]

Mr./Ms. _____

Position: _____

Address: _____

Phone number: _____

Fax: _____

Email: _____

Account: _____

TIN: _____

Power of Attorney No. _____ dated _____ (in case of authorization).

Parties (hereafter referred to as "members") have reached a consensus on entering into a joint venture agreement with the following contents:

Article 1. General principles

1. Members voluntarily establish this joint venture to participate in the process of bidding for _____ [insert name of procurement package] of _____ [insert project name].

2. Official name of the joint venture used in every transaction related to the procurement: _____ [insert the agreed name of the joint venture].

3. Every member is committed not to unilaterally participate or establish a joint venture with another member to participate in this procurement. If awarded the contract, no member is entitled to refuse to fulfill the duties and obligations prescribed in the contract. Any member of the joint venture that refuses to perform their duties as agreed must:

- Pay damages to other parties in the joint venture;

- Pay damages to Employer as prescribed by the contract;
- Be subject to other disciplinary actions _____ [specify the action].

Article 2. Division of responsibilities

All members unanimously to undertake joint and separate responsibility to execute _____ [insert name of procurement package] of _____ [insert project name] as follows:

1. Lead member of the joint venture:

All parties unanimously authorize _____ [insert name of a party] as the Lead member of the joint venture who represents the joint venture to perform the following tasks ⁽³⁾:

[- Sign the Letter of Bid of Technical Proposal or Financial Proposal;

- Sign documents with The employer during the short listing processing, including the request for Clarification of Bidding Documents and Bids; sign requests for bid withdrawal, modification or substitutions;

- Provide Bid Security for the joint venture;

- Participate in contract negotiation and conclusion;

- Sign complaint letter (if any);

- Perform other tasks except for contract conclusion: _____ [specify other tasks (if any)].

2. Tasks of joint venture members are specified in the table below⁽⁴⁾:

No.	Name	Tasks	Proportion of total bid
1	Name of Lead member	- _____ - _____	- _____% - _____%
2	Name of second member	- _____ - _____	- _____% - _____%
....			
Total		All tasks of the procurement	100%

Article 3. Effect of Joint venture agreement

1. The Joint venture agreement takes effect from the date of signing.

2. The Joint venture agreement expires in the following cases:

- All parties have fulfilled their duties and finalized the contract;
- The agreement is unanimously terminated by all parties;
- The joint venture is not awarded the contract;

- The bidding for _____ *[insert name of the procurement package]* of _____ *[insert the project name]* is cancelled as notified by The employer .

The joint venture agreement is made into _____ copies with equal legal value, each party keeps _____ copies.

LEGAL REPRESENTATIVE OF LEAD MEMBER

[Full name, position, signature and stamp]

LEGAL REPRESENTATIVE OF JOINT VENTURE MEMBER

[Full name, position, signature and stamp of each member]

Notes:

(1) Depending on size and nature of the procurement, this Joint venture agreement may be amended. If the procurement is divided into independent lots, the Joint venture agreement shall specify names and numbers of lots in which the joint venture participates, and clarify joint and separate responsibilities of every joint venture member.

(2) Provide updated legal normative documents in force.

(3) Scope of authorization includes one or multiple tasks above.

(4) The Bidder shall specify detailed tasks and estimate equivalent value of tasks performed by every joint venture member, joint and separate responsibilities of member, including the Lead member.

Form No.04 (a): Bid security for single bidder
BID SECURITY⁽¹⁾
(Applicable to Single Bidder)

Beneficiary: ____ *[insert name and address of The employer]*

Date of issuance: ____ *[insert date of issuance]*

BID GUARANTEE No. ____ *[insert reference number of the Bid Guarantee]*

Guarantor: ____ *[insert name and address of issuing bank, if it is not written in the title]*

We have been informed that ____ *[name of the Bidder]* (hereinafter called "the Bidder") has submitted to participate in the bid for the execution of ____ *[name of procurement package]* of ____ *[insert project name]* under Invitation to Bid No. *[insert reference number of the Invitation to Bid]*.

We hereby undertake with the Beneficiary that we guarantee for the Bidder to participate in the bid for this procurement with an amount of ____ *[insert amount in figures, in words and currency]*.

This Guarantee takes effect within ____ ⁽²⁾ days, from ____ *[insert date]* ⁽³⁾.

At the request of the Bidder, we, as the Guarantor, hereby undertake to pay you, the Beneficiary, any sum or sums not exceeding in total an amount of ____ *[insert amount in figures]* (____) *[insert amount in words]* upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s), because the Bidder:

1. Has withdrawn its Bid after the bid closing time and during the effective period of bid;
2. Has violated law on bidding leading bid cancellation as prescribed in Point d of Section 41.1 – Instructions to Bidder of the Bidding Documents;
3. Fails or refuses to negotiate the contract within 5 working days, from the date on which the notification of contract negotiation sent by The employer is received, excluding force majeure events;
4. Fails or refuses to finalize the contract within 20 days, from the date on which the notification of bid acceptance sent by The employer is received, or refuses to conclude the contract after the contract finalization excluding force majeure events;
5. Fails to furnish performance Security as prescribed in Section 41.1 - Instructions to Bidders of the Bidding Documents.

If the Bidder is selected, this Guarantee shall expire when the Bidder concludes the contract and furnishes performance Security to the beneficiary as agreed.

If the Bidder is not selected, this Guarantee shall expire upon our receipt of a photocopy of notification of bidder selection result sent by the beneficiary; within 30 days after the expiration of the Bidder's Bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

Legal representative of Bank

[Full name, position, signature and stamp]

Notes:

- (1) Applicable to Bid Security in the form of Bid Guarantee issued by a credit institution or a branch of foreign bank established under Vietnamese law.
- (2) Insert as prescribed in Section 19.2 of the **BDS**.
- (3) Insert the bid closing date as prescribed in Section 22.1 of the **BDS**.

Form No.04 (b): Bid security for Joint Venture
BID SECURITY⁽¹⁾
(Applicable to Joint Venture)

Beneficiary: ____ *[insert name and address of The employer]*

Date of issue: ____ *[insert date of issue]*

BID GUARANTEE No. ____ *[insert reference number of the Bid Guarantee]*

Guarantor: ____ *[insert name and address of issuing bank, if it is not written in the title]*

We have been informed that ____ *[insert name of the Bidder]*⁽²⁾ (hereinafter called "the Bidder") has submitted to participate in the bid for the execution of ____ *[insert name of procurement package]* of ____ *[insert project name]* under Invitation to Bid.

We hereby undertake to guarantee for the Bidder to participate in the bid for this procurement with an amount of ____ *[insert amount in figures, in words and currency]*.

This Guarantee takes effect within ____⁽³⁾ days, from ____ *[insert date]*⁽⁴⁾.

At the request of the Bidder, we, as the Guarantor, hereby undertake to pay you any sum or sums not exceeding in total an amount of ____ *[insert amount in figures]* (____) *[insert amount in words]* upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s), because the Bidder:

1. Has withdrawn its Bid after the bid closing time and during the effective period of bid;
2. Has violated law on bidding leading bid cancellation as prescribed in Point d of Section 41.1 - Instructions to Bidder of the Bidding Documents;
3. Fails or refuses to negotiate the contract within 5 working days, from the date on which the notification of contract negotiation sent by The employer is received, excluding force majeure events;
4. Fails or refuses to finalize the contract within 20 days, from the date on which the notification of bid acceptance sent by The employer is received, or refuses to conclude the contract after the contract finalization excluding force majeure events;
5. Fails to furnish performance Security as prescribed in Section 43 - Instructions to Bidders of the Bidding Documents.

If any member in the ____ *[insert complete name of the joint venture]* violates regulations of law leading ineligible for Bid Security return as prescribed in Section 19.5 – Instructions to Bidder, the Bid Security of all joint venture members shall not be returned.

If the Bidder is selected, this Guarantee shall expire when the Bidder concludes the contract and furnishes performance Security to the beneficiary as agreed.

If the Bidder is not selected, this Guarantee shall expire upon our receipt of a photocopy

of notification of bidder selection result sent by the beneficiary; within 30 days after the expiration of the Bidder's Bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

Legal representative of Bank

[Full name, position, signature and stamp]

Notes:

(1) Applicable to Bid Security in the form of Bid Guarantee issued by a credit institution or a branch of foreign bank established under Vietnamese law. The bank is recommended to use this Form. If another form is used and contains any of the following violations: bid security having a lower value or shorter effective period as required in ITB Item 19.2, Employer's name (beneficiary) displayed on the bid security being inaccurate, the original of bid security not being enclosed and bid security bearing invalid signature, or containing unfavorable conditions for Employer, then the Bid Security shall be considered invalid.

(2) The Bidder's name may be inserted in one of the following ways:

- Name of the whole joint venture, for example Bidder A and Bidder B enter into a joint venture to make a bid, their name shall be "Joint Venture A + B";
- Name of the member in charge of the Bid Security for the joint venture or another member in the joint venture, for example, A + B + C joint venture makes a bid, if their joint venture agreement assign A bidder to furnish Bid Security for the joint venture, the joint venture's name shall be "Bidder A (on behalf of Joint Venture A + B + C)";
- Name of every joint venture member separately furnishing the Bid Security.

(3) Insert as prescribed in Section 19.2 of the **BDS**.

(4) Insert the deadline date as prescribed in Section 22.1 of the **BDS**.

Form No.05 (a): Bidder Information Sheet
BIDDER INFORMATION SHEET

Date: _____

ID number and name of procurement package: _____

Page: _____ / _____

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

In case of joint venture, name of each party: ____

Place of business registration and operation: ____*[insert province/city where the Bidder registers and operate business]*

Year of incorporation: ____*[insert year of incorporation]*

Bidder's legal address: ____*[insert the registered address]*

Bidder's legal representative information

Name: _____

Address: _____

Telephone/Fax: _____

Email Address: _____

1. Attach copies of one of the following documents: Certificate of Incorporation, Establishment Decision or equivalent documents issued by competent agencies in the country where the Bidder operates.

2. Diagram of organizational structure of the Bidder.

Form No.05 (b): of Joint Venture Member Information Sheet
JOINT VENTURE MEMBER INFORMATION SHEET (1)

Date: _____
Number and name of procurement package: _____

Page: _____ / _____

Name of JV Bidder:
Name of JV member:
Country of Registration of JV Member:
Year of Establishment of JV Member:
Legal Address of JV member in Country of Registration:
Legal representative of JV member information Name: _____ Address: _____ Telephone/Fax: _____ Email Address: _____
1. Attach a copy of one of the following documents: Certificate of Incorporation, Establishment Decision or equivalent documents issued by competent agencies. 2. Diagram of organizational structure.

Notes:

(1) In case of joint venture, each JV member shall fill in this form.

Form No.06: History of non-performing contracts

**HISTORY OF NONPERFORMING CONTRACTS OCCURRING AS A RESULT OF
CONTRACTOR FAULT ⁽¹⁾**

Bidder's name: _____

Date: _____

Name of Joint Venture Partner (if any): _____

Nonperforming Contracts Occurring as a Result of Contractor fault in the Past as indicated in Section 2.1 in Chapter III			
☐ Nonperformance of any Contracts that did not occur as a result of contractor fault since January 1, [insert year] according to Criteria 1 included in Table of Qualification (Capacity and Experience) Criteria under Section 2.1 in Chapter III.			
☐ Nonperformance of any Contracts that occurs as a result of contractor fault since January 1, [insert year] according to Qualification (Capacity and Experience) Criteria under Section 2.1 in Chapter III.			
Year	Amount of Non performed Portion of Contract	Description	Total Contract Amount including amount, currency forex rate, USD/VND equivalent)
		Contract identification: _____ Investor 's name: _____ Address: _____ Reason(s) for nonperformance: _____	

Notes:

(1) The Bidder shall provide accurate and authentic information about nonperforming contracts that occurred as a result of contractor fault; If the Procuring Agency discovers that the Bidder does not include non performed contracts occurring as a result of contractor fault in its Bid, the Bidder shall be deemed as performing the fraudulent practice and its Bid shall be rejected or disqualified. Each Joint Venture Partner must fill out this Form.

**Form No.07: Pending litigation
(Not applicable)**

PENDING LITIGATION⁽¹⁾

Bidder's name: _____

Date: _____

Name of joint venture member (if any): _____

Pending litigation			
Choose one of the following descriptive information:			
☐ No pending litigation.			
☐ Description of Pending litigation in which the Bidder is a litigant (or each joint venture member is a litigant regarding joint venture).			
Year	Dispute	Value of pending litigation in VND	Ratio of value of pending litigation to Net Worth

Notes:

(1) The Bidder must declare accurately and truthfully Pending litigation; failure to declare any pending litigation shall be considered fraud and the Bid shall be rejected accordingly.

For a joint venture, each joint venture member shall declare information using this Form.

Form No.08: Past performance of similar contracts performed

SIMILAR CONTRACT PERFORMED BY THE BIDDER⁽¹⁾

Bidder's name: *[insert full name of the Bidder]*.

Each contract should consist of the following particulars:

Name and reference number of the contract	<i>[insert full name and reference identification number of the contract]</i>		
Contract Effective Date	<i>[insert day, month, year]</i>		
Completion date	<i>[insert day, month, year]</i>		
Total contract amount	<i>[insert total contract amount and currency(ies)]</i>		Equivalent to USD/VND
Each Joint Venture Partner shall insert the summary of part of work it assumed and amount of portion of the contract it assumed	<i>[insert the summary of part of work that it undertook as a Joint Venture Partner]</i>	<i>[insert the ratio in percentage of the amount of the portion of contract that it assumed to total contract price; contract sum and currency(ies) already agreed upon]</i>	Equivalent to USD/VND _____
Project identification:	<i>[insert full name of the project under the contract in question]</i>		
Investor's name:	<i>[insert full name of the Investor under the contract in question]</i>		
Address: Telephone/fax: E-mail:	<i>[insert full current address of the Investor]</i> <i>[insert telephone and fax number, including country and region code]</i> <i>[insert e-mail address]</i>		
Description of similarities as defined in Section 2.1 of Chapter III ⁽²⁾			
1. Type of Goods	<i>[insert information as appropriate]</i>		
2. Regarding the amount of the contract that was performed	<i>[insert the actual amount of contract performed based on the amount of contract determined during the acceptance testing or contract termination process]</i>		
3. Regarding size of performance	<i>[insert the size specified in the contract]</i>		
4. Other specifications	<i>[insert other specifications where necessary]</i>		

Notes:

Bidders should scrutinize the BD and propose different types of similar contracts to satisfy BD requirements.

(1) In case of Joint Venture, each JV Partner must fill out this Form. If a Bidder has multiple Contracts, insert each of these Contracts to fill out this Form.

(2) The Bidder only inserts similarities to the procurement requirements.

Form No.09: Financial status of the Bidder
BIDDER'S FINANCIAL SITUATION⁽¹⁾

Bidder's name: _____

Date: _____

Name of Joint Venture Partner (if any): _____

	Bidder's fiscal year starting on day month and ending on day month (the Bidder must insert year) Financial figures in the latest year subject to BD requirements (Autocompleted by the System on the basis of the Bidder's fiscal year)		
	Year 1:	Year 2:	Year 3:
Total Asset			
Total Liabilities			
Net Worth			
Annual Turnover (exclusive of VAT)			
Average Annual Turnover (exclusive of VAT) ⁽²⁾	<i>(Auto calculated by the System)</i>		
Before-Tax Profits			
After-Tax Profits			

Notes:

(1) In case of Joint Venture, each JV Partner must fill out this Form.

(2) In order to determine the Average Annual Turnover (exclusive of VAT), the Bidder shall divide total turnover of years (exclusive of VAT) by years based on the provided information.

Turnover of each year is computed as total turnover in that year's financial statement (exclusive of VAT).

Average Annual Turnover (exclusive of VAT) = total turnover each year (exclusive of VAT) subject to BD requirements/number of years.

If the Bidder's number of foundation years is less than the number of years required in the BD, the Average Annual Turnover (exclusive of VAT) is calculated on the basis of the number of years within which its financial data are obtained.

Annual Turnover (exclusive of VAT) is obtained from the Bidder's qualification documentation. If the Bidder realizes that Annual Turnover (exclusive of VAT) included in the Bidder's qualification documentation has not yet been obtained from the

Electronic Taxation System and the National Information System for Business Registration, the Bidder shall, on its own account, insert updated information about Annual Turnover (exclusive of VAT) in its qualification documentation for the purpose of participation in the procurement. In this case, the Bidder shall prepare documentary evidence of the information that it has provided during the contract negotiation process as follows:

Copies of financial statements (balance sheets, including all related interpretations and income statements) for the years specified above must conform to the following conditions:

1. Reflecting financial situation of the Bidder or the JV Partner (in case of Joint Venture Party), not that of an associated or affiliated entity like parent company in connection with subsidiary(ies), or associate(s) or affiliate(s) with the Bidder or JV Partner(s).

2. Financial statements must be complete and contain all required information.

3. Financial statements must correspond to accounting terms completed, enclosing the authenticated copy(ies) of one of the following literature:

- Tax finalization inspection report;

- Tax (VAT and CIT) finalization form contains a tax agency's confirmation of the time of submission of the form;

- Documentary evidence of the Bidder's completed submission of the electronic tax finalization form;

- A tax agency's written confirmation (confirming total full-year tax amount) of discharge of tax payment obligations;

- Audit report (if any);

- Other literature.

Form No.10: Financial Resources
(Not applicable)

FINANCIAL RESOURCES ⁽¹⁾

Clearly state expected financial resources, for example liquid assets ⁽²⁾, credit limit and other financial resources (other than advance payment under the contract) that are available for satisfying the financial resource requirements prescribed in Form No. 11 of this Chapter.

Financial resources of Bidder		
No.	Financial resource	Amount (in USD/VND)
1		
2		
...		
Total financial resources of Bidder (TNL)		

Notes:

(1) Every bidder or joint venture member shall provide information about their financial resources, enclosed with documentary evidence.

Expected financial resources shall be determined by the following formula:

$$\text{NLTC} = \text{TNL} - \text{DTH}$$

Where:

- NLTC means financial resources which Bidder expects to mobilize to perform the contract;
- TNL means total financial resources of Bidder (prescribed in this Form);
- DTH means total of monthly financial resource requirements for current contracts (prescribed in Form No. 11).

A bidder shall be considered responsive to financial resource requirements if its NLTC $\geq$ required value of financial resources prescribed in criterion 3.3. Section 2.1 of Chapter III - Bid Evaluation Criteria.

If, in its Bid, the Bidder submits a statement of credit commitment issued by a credit institution lawfully operating in Viet Nam, in which the credit institution undertakes to provide credit for the Bidder to implement the procurement under consideration with the minimum credit line equal to the required value of financial resources prescribed in criterion 3.3. Section 2.1 of Chapter III - Bid Evaluation Criteria, the Bidder shall be evaluated as responsive in terms of financial resource requirement and is not required to fill in this Form and Form 11.

Form No.11: Monthly financial resource for current contracts
(Not applicable)

MONTHLY FINANCIAL RESOURCES FOR CURRENT CONTRACTS⁽¹⁾

No.	Name of contract	Contact person of Employer (address, phone number, fax)	Completion date of contract	Number of remaining months of contracts (A)⁽²⁾	Unpaid contract value, inclusive of taxes (B)⁽³⁾	Monthly financial resource requirements (B/A)
1						
2						
3						
...						
Total of monthly financial resource requirements for current contracts.						

Notes:

(1) Each bidder or joint venture member shall provide information below to calculate all required financial resources, which is all value of: (i) current commitments of the Bidder (or each joint venture member) in all current contracts or to be executed; (ii) required financial resources of the considered contract by Employer. In addition, the Bidder shall provide information about any other financial obligations that are likely to substantially affect the execution of the considered contract if the Bidder is awarded the contract.

(2) Number of remaining months of contract at 28 days prior to the bid submission deadline.

(3) Unpaid value of contract at 28 days prior to the bid submission deadline.

Form No.12: List of proposed key specialists
LIST OF PROPOSED KEY SPECIALISTS

- For each work position as specified at this form, bidders shall declare the detail information as follow Form No.13 and Form No.14 in this chapter.
- Bidders shall declare key specialists that have enough experience to meet requirements as specified at Article 2.2 Chapter III - Bid Evaluation Criteria and available for involve to this package; bidders shall not declare specialists that already involved to other package that have working time period coincides with performance duration of this package.

1	Work position: [fill specify the position assumed in this package]
	Name: [key specialists' name]
2	Work position: [fill specify the position assumed in this package]
	Name: [key specialists' name]
3	Work position
	Name
4	Work position
	Name
5	Work position
	Name
....	Work position
	Name

Form No.13: Key specialist personal profile
KEY SPECIALIST PERSONAL PROFILE

The bidder shall submit all information as requirement below and shall attach the notarized copy of correlative diplomas and certificates

Position		
Personal information	Name	Date of Birth:
	Occupational skills	
Current Jobs	Name of the employer	
	Address of the employer	
	Phone	Contact person (manager/ human resource officer)
	Fax	E-mail
	Title	Number of years working at the employer

Form No.14: List of professional experience
LIST OF PROFESSIONAL EXPERIENCE

Summary of professional experience in the following order from the current backwards. Indicate the specific expertise and management experience related to the bidding package.

From	To	Company/ Project/ Position/ Professional and Management Experience related

Form No.15 (a): Scope of works of subcontractor
SCOPE OF WORKS OF SUBCONTRACTOR ⁽¹⁾

No.	Name of Subcontractor(2)	Scope of Works(3)	Volume of works(4)	Estimated percentage cost(5)	Contract or agreement with subcontractors(6)
1					
2					
3					
4					
...					

Note:

(1) In case the use of subcontractors, Contractors shall declare under this Form.

(2) Contractors specify the name of the subcontractors. In case at the moment of the participation in the , subcontractors ve not been specifically determined Contractors shall not be declared in this column, but only to declare the column “Scope of Works”. After that, in case of award of the contract, when mobilized subcontractors performing works were declared to be approved by Employer.

(3) Contractors specify item of works of the subcontractor.

(4) Contractors specify volume of works of the subcontractor.

(5) Contractors specified value of percentage (%) of work that subcontractors execute than the bid price.

(6) Contractors specify the number of the contract or agreement; the contractor must also submit original or notarized copies of such documents.

Form No.15 (b): List of specialized subcontractors
LIST OF SPECIALIZED SUBCONTRACTORS ⁽¹⁾

The contractor must provide documents meeting the requirements specified in Article 2.3 of Chapter III - Bid Evaluation Criteria.

No.	Name of specialized subcontractors(2)	Scope of works(3)	Volume of works(4)	Estimated percentage cost(5)	Contract or agreement with specialized subcontractors(6)
1					
2					
3					
4					
...					

Note:

- (1) Where the use of specialized subcontractors shall declare under this Form.
- (2) Contractors specify the name of specialized subcontractors.
- (3) Contractors specify item of works of specialized subcontractors.
- (4) Contractors specify volume of works of specialized subcontractors.
- (5) Contractors specified value of percentage (%) of work that specialized subcontractors execute than the bid price.
- (6) Contractors specify the number of the contract or agreement; contractors must also submit original or notarized copies of such documents.

**LIST OF SUBSIDIARIES, MEMBER COMPANIES OF
UNDERTAKING WORKS OF THE PACKAGE ⁽¹⁾**

No	Name of Subsidiaries, Member company⁽²⁾	Item of works ⁽³⁾	Percentage cost of work compared with bid price⁽⁴⁾	Note
1				
2				
...				

Note:

(1) In case the contractor participating in the bid is the parent company (for example, a Corporation) that mobilizes its subsidiary or member company to perform part of the work in the bidding package, it must be specified in this table. The evaluation of the contractor's experience and capacity is based on the value and volume undertaken by the parent company, subsidiary, and member company in the bidding package. In case the participating contractor is not the parent company, this Form is not applicable.

(2) Specify the name of the subsidiary or member company.

(3) Specify the part of the work undertaken by the subsidiary or member company.

(4) Specify percentage cost of work undertaken by the subsidiary or the member company compared to the bid price.

B. BID FORMS OF FINANCIAL PROPOSAL

Form No.16 (a): Letter of BID

LETTER OF BID ⁽¹⁾ (of Financial Proposal)

(applicable to the Bidder who has no discount offer or has discount offer submitted in a separate Letter of Discount)

Date: ____ *[insert date of signing of Letter of Bid]*

Name of procurement package: ____ *[insert the name of procurement package according to the Invitation to Bid]*

Project name: ____ *[insert the project name]*

Invitation to Bid No. ____ *[insert the number of the Invitation to Bid regarding selective bidding]*

To: ____ *[insert the complete and accurate name of The employer]*

After carefully studying the Bidding Documents and revisions thereof number ____ *[insert the number of the revisions (if any)]*, we, ____ *[insert the Bidder's name]*, pledge ourselves to perform ____ *[insert the name of procurement package]* in accordance with the Bidding Documents. In conjunction with Technical Proposal, we hereby enclose Financial Proposal with the total amount ____ *[insert the amount in figures, in words, and currency]* ⁽²⁾ together with the Table of bid price.

This Financial Proposal takes effect within ____ ⁽⁴⁾ days, from date ____, month ____, year *[____ insert date]* ⁽⁵⁾.

Legal representative of bidder
[Full name, position, signature and stamp] ⁽⁶⁾

Notes:

(1) Bidder must provide sufficient and accurate information including names of The employer and the Bidder, effective period of the Financial Proposal, which bears the signature and stamp (if any) and of the bidder's legal representative.

(2) The bid price must be stated in a specific and fixed amount, both in figures and in words, and shall in line with the total amount indicated in the summary of costs; the bidder shall neither propose various bid prices nor tie the bid price to conditions that are disadvantageous to Employer or The employer . In case the procurement is divided into independent lots, the Bidder shall provide bid price for each lot and total bid price for the lots for which the Bidder make bids. If bidders are permitted to offer in more than one currency, the Bidder should clearly state the amount in words and figures for each currency quoted.

(3) Insert number of effective days prescribed in ITB Item 18.1. Effective period of the Bid is from the deadline for the submission of bids to its expiration date as prescribed

in the Bidding Documents. period of time from the deadline time for the submission of bids to 24:00 of the deadline date is considered 01 day.

(4) Insert the date of bid closing as prescribed in Section 22.1 of the BDS.

(5) If the bidder's legal representative authorizes his/her subordinate to sign the Letter of Bid, a Power of Attorney (Form No. 2 provided in this Chapter) must be enclosed. If the company's charter or another document permits such subordinate to sign the Letter of Bid, such document shall be enclosed (In this case, the Power of Attorney is not required). If the bidder is a joint venture, the Letter of Bid shall be signed by legal representative of every joint venture member, unless the lead member of the joint venture may sign the Letter of Bid according to the joint venture agreement as mentioned in Form No. 03 of this Chapter. If each JV member uses authorization, it is similar to the case of single bidder. The successful bidder must present certified true copies of these documents to Employer before contract conclusion. If information provided is found inaccurate, the bidder shall be considered having violated ITB Item 3.

(6) If a foreign bidder has no seal, a certification must be issued by a competent agency that the signature in the Letter of Bid and any other documents of the Bid belongs to its legal representative.

Form No.16 (b): Letter of BID (include discount)
SUBMISSION LETTER ⁽¹⁾
(of Financial Proposal)

(applicable to the Bidder who has discount offer in the Letter of Bid)

Date: ____ *[insert date of signing of Letter of Bid]*

Name of procurement package: ____ *[insert the name of procurement package according to the Invitation to Bid]*

Project name: ____ *[insert the project name]*

Invitation to Bid No. ____ *[insert the number of the Invitation to Bid regarding selective bidding]*

To: ____ *[insert the complete and accurate name of The employer]*

After carefully studying the Bidding Documents and revisions thereof number ____ *[insert the reference number of the revisions (if any)]*, we, ____ *[insert the Bidder's name]*, pledge ourselves to perform ____ *[insert the name of procurement package]* in accordance with the Bidding Documents. In conjunction with Technical Proposal, we hereby enclose Financial Proposal with the total amount ____ *[insert the amount in figures, in words, and currency]* ⁽²⁾ together with the Table of bid price.

In addition, we voluntarily offer a discount of bid price with an amount ____ *[insert the discount amount in figures, in words and in currency]*.

The bid price after deducting discount is: ____ *[insert the amount in figures, in words and in currency]* ⁽³⁾.

This Financial Proposal takes effect within ____ days⁽⁴⁾, from date ____, month ____, year ____ *[insert date]* ⁽⁵⁾.

The legal representative of the Bidder⁽⁶⁾
[Full name, position, signature and stamp]⁽⁷⁾

Note:

(1) Bidder must provide sufficient and accurate information including names of The employer and the Bidder, effective period of the Financial Proposal, which bears the signature and stamp (if any) and of the bidder's legal representative.

(2) The bid price must be stated in a specific and fixed amount, both in figures and in words, and shall in line with the total amount indicated in the summary of costs; the bidder shall neither propose various bid prices nor tie the bid price to conditions that are disadvantageous to Employer or The employer . In case the procurement is divided into independent lots, the Bidder shall provide bid price for each lot and total bid price for the lots for which the Bidder make bids. If bidders are permitted to offer in more than one currency, the Bidder should clearly state the amount in words and figures for each currency quoted.

(3) Specify whether discount applies to the whole procurement package or only one or several tasks or items (clearly state which tasks or items)

(4) Insert number of effective days prescribed in ITB Item 18.1. Effective period of the Bid is from the deadline for the submission of bids to its expiration date as prescribed in the Bidding Documents. period of time from the deadline time for the submission of bids to 24:00 of the deadline date is considered 01 day.

(5) Insert the date of bid closing as prescribed in Section 22.1 of the BDS.

(6) If the bidder's legal representative authorizes his/her subordinate to sign the Letter of Bid, a Power of Attorney (Form No. 2 provided in this Chapter) must be enclosed. If the company's charter or another document permits such subordinate to sign the Letter of Bid, such document shall be enclosed (In this case, the Power of Attorney is not required). If the bidder is a joint venture, the Letter of Bid shall be signed by legal representative of every joint venture member, unless the lead member of the joint venture may sign the Letter of Bid according to the joint venture agreement as mentioned in Form No. 03 of this Chapter. If each JV member uses authorization, it is similar to the case of single bidder. The successful bidder must present certified true copies of these documents to Employer before contract conclusion. If information provided is found inaccurate, the bidder shall be considered having violated ITB Item 3.

(7) If a foreign bidder has no seal, a certification must be issued by a competent agency that the signature in the Letter of Bid and any other documents of the Bid belongs to its legal representative.

Introduction:

1. Form No.17.1: Total Price summary table

In this table, the Bidder shall show the total price which are shown in form 17.2

2. Form No.17.2 (Price for Equipments and services in this package) = Form No.17 (a1.1) + Form No.17 (a2.1) + Form No.17 (b.1).

In this table, the Bidder shall plus the total of items of parts (eg: Hardware, software ...of HSS, service...include the Equipments and services in this package which are shown in the detail tables (Form No.17 (a1.1), Form No.17 (a2.1), Form No.17 (b.1).

2.1. Form No.17 (a1.1)

This table for the produced/processed goods or internationally produced/processed goods, which have been imported and offered for sale in Viet Nam, the Bidder offers as specified in this form, including all taxes, fees and charges (if any).

2.2. Form No.17 (a2.1)

This table for the produced/processed goods or internationally produced/processed goods, local Bidder (if any) offers the price on the basis delivery to warehouse of Employer. This price is including all tax, fees and charges (if any) as specified in this form.

2.3. Form No.17 (b.1)

This table for related services, the Bidder offers as specified in this form, including all taxes, fees and charges (if any).

Form No.17.1: Total Price summary table
TOTAL PRICE SUMMARY TABLE

No.	Content	Bid price
1	Locally produced/ processed goods or Internationally produced/ processed goods which have been imported and offered for sale in Viet Nam	(M1)
2	Internationally produced/ processed goods	(M2)
3	Services	(I)
	Total bid price (Switch to the Submission Letter)	(M1) + (M2) + (I)

The legal representative of the Bidder

[name and title, sign and stamp]

Form No.17.2: Price summary table

**Price summary table (Price for Equipments and services in this package) =
Form No.17 (a1.1) + Form No.17 (a2.1) + Form No.17 (b.1).**

**PRICE SUMMARY TABLE
for Equipments and services in this package**

Unit: USD/VND

No.	Items	Total Price
I	HSS	
1	Hardware (HW)	(Am1+Tm1)
2	Software (SW)	(Am2+Tm2)
		
	Total I	
II	Spare part	(Amn+Tmn)
1	Spare part for	
2	Spare part for	
		
	Total II	
III	Services	(Im)
1	Site survey, installation, integration and commissioning ...	Im₁
2	Installation supervision, commissioning, integration and put into service.	Im₂
3	Upgrade to the latest software version, which shall include software...	
4	Insurance to the date of PAC	
5		
6	Project Management	
		
	Total III	
IV	Total goods price excluding taxes, fees and charges (if any)	Am
V	Total taxes, fees and charges (if any)	Tm
VI	Total bid price of goods including taxes, fees and charges (if any)	Mn

* Equipments and services must include warranty of 24 months

The legal representative of the Bidder

[name and title, sign and stamp]

Note:

- **Note: Form No.17.2 = No.17 (a1.1)+ No.17 (a2.1)+No.17 (b.1)**
- ***“m”: Equipments and services in this package***

*** REQUIREMENTS:**

1. In each item, Bidder is requested to offer detailed descriptions including: manufacturer, country of origin, product code, quantity, unit price, total price, etc.
2. In the process of offering price:
 - + After discount (if any), the unit price of spare part must not be higher than unit price of main equipment in Bid quotation list.
 - + After discount (if any), the items have the same commodity code (Item code or product code or Part number ...) must have the same unit price.
 - + After discount (if any), the items with the same functionality and capability (hardware or software or features ...) must have the same unit price.
3. The Bid shall be required to propose a detailed price to every card functionality.
4. VNPT/VNPT Net has the right to buy the whole or a part of equipment with unlimited quantity for other projects of VNPT (if any) with the unit price after discount of this Bid.
5. Currency of Bid:
 - + All of equipment and related services supplied from abroad must be quoted by US Dollar (USD).
 - + All of equipment and related services supplied from inside Viet Nam territory must be quoted by Vietnamese Dong (VND).

NOTE:

The items from Requirements 1, 2, 3, 4, 5 in the form above are Pre-requisitioned conditions.

On separated BoQ following Template

BID PRICE OF INTERNATIONALLY PRODUCED/ PROCESSED GOODS

The legal representative of the Bidder
[name and title, sign and stamp]

In the column (3),(4) (5), (6), (7), (8), (9), (10), (11), (12), (13) the Bidder offers. Employer

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Form No.17 (a2.1): Goods manufactured or processed in Viet Nam

1 No.	2 List of Goods	3 Marking Code	4 Brand Name	5 Year of Manufacture	6 Basic Configuration and Technical Specifications	7 Unit	8 Quantity	9 Origin	10 Unit Price	11 Amount (Column 9x11)	12 Taxes, fees and charges (if any)
										Am1	Tm1
										Am2	Tm2
	Total goods price excluding taxes, fees and charges (if any)										
	Total taxes, fees and charges (if any)										
	Total bid price of goods including taxes, fees and charges (if any) (Switch to Price Summary Table)										
										(M*)* = Am1 + Am2 + ...Amn	Tm = Tm1 + Tm2 + ...Tmn
										M1 = M* + Tm	

The legal representative of the Bidder
[name and title, sign and stamp]

Note:

In the column (1), (2), (the Bidder records in accordance with list of goods specified in Part II - Technical Requirements.

In the column (3),(4) (5), (6), (7), (8), (9), (10), (11), (12), (13) the Bidder offers.

The amount (M*) shall exclude import duties, fees, charges related to importation, special consumption tax (if any), and value-added tax (VAT), and shall serve as the basis for comparison and ranking of bidders. The values of import duties, fees, charges related to importation, special consumption tax (if any), and VAT shall not be taken into account during the evaluation process for comparison and ranking of bidders. The proposed contract award price and the contract price must include the values of import duties, fees, charges related to importation, special consumption tax (if any), and VAT

Form No.17 (b.1): Cost breakdown of services

COST BREAKDOWN OF SERVICES

1	2	3	4	5	6	7	8
No.	Description of services	Volume	Unit	Location of performing service	Date of Completion service	Bid unit price	Amount (3x7)
1							
2							
3							
	...						
Total bid price for services excluding taxes, fees and charges (if any)							
Total taxes, fees and charges (if any)							
Total bid price for services including taxes, fees and charges (if any)							
(Switch to Price summary table)							
(1)							

Legal representative of Bidder

[name, title, signed and stamped]

Note:

Employer fill Columns (1), (2), (3), (4), (5) and (6) accordance with List of services as specified at Part II - Chapter V.

Form No.18.1: Domestic costs breakdown of preferential goods and services

**DOMESTIC COSTS BREAKDOWN
OF PREFERENTIAL GOODS AND SERVICES(1)**

No.	Name of Items	Value
I	GOODS	$\Sigma G = G1 + \dots + Gn$
1.1	Name of the first goods	
	The offered price of goods in the bid	(I)
	Taxes (include import tax for components, devices constituting goods, VAT and other taxes payable for the imported goods)	(II)
	Declare import costs in goods include fees, charges (if any)	(III)
	Domestic costs	$G1 = (I) - (II) - (III)$
	...	
1.n	Name of nth goods	Gn
II	SERVICES	$\Sigma S = S1 + \dots + Sn$
2.1	Name of the first service	
	Domestic costs	$S1$
	...	
2.n	Name of nth service	
	...	Sn
III	TOTAL DOMESTIC COSTS	$P^* = \Sigma G + \Sigma S$
IV	BID PRICE (excluding taxes, fees and charges (if any))	P
V	PERCENTAGE OF DOMESTIC COSTS	$D (\%) = P^* / P (\%)$

Legal representative of Bidder

[name, title, signature and seal]

Note:

(1) In case offered goods and services are not eligible for preferences, the bidders shall not declare this Form.

**Form No.18.2: Cost breakdown of Post-Warranty Technical support service quotation for each year after the warranty
COST BREAKDOWN OF TECHNICAL SUPPORT SERVICES EACH YEAR AFTER THE WARRANTY**

Bidder must Offer the Detail of Technical support service price (Breakdown) for all the purchased equipment on this Bidder after two-year warranty period included as following; In case the Bidder does not offer details (Breakdown), it is understood that the items are divided equally:

No	Item	Qty	Scope of Post-Warranty Technical support service	Unit Price	Price before VAT	VAT	Total Price included VAT
I							
1							
2							
	Total						
II	Other Cost...						
							
	Grand total						

Legal Representative of the Bidder
(Full Name, Title, Sign and Company Stamp)

Form No.18.3 Commitment of providing Post-warranty technical support service

Commitment of providing Post-warranty technical support service

To:

(Called Employer)

We, _____ [Name of the Bidder] established and started the business operation from date _____ month _____ year _____, produce of the good _____ [name of supplied product] having principle address at _____ [address of the bidder]. With this signed letter, we commit to supply maintenance support services for the products proposed in the proposal for period after Warranty at not exceeding price proposed in the Bidder _____ [name of Bidder package] in case Employer requires. Employer reserves the right in making decision of buying or not buying the post-warranty maintenance support services from us.

In case that the commitment shall not be delivered by the bidder, Employer may apply penalty such as putting the bidder into denial list of future bidding package.

Legal Representative of the bidder

[Full Name. Title, Sign and Company Stamp]

Form No 18.4 - Statement of Compliance to meet the requirements - Instructions to Bidders - Bidding Data

No	Description	Requirement	Statement of Compliance of Bidder (FC/NC/PC)	Reference	Note
Chapter I	INSTRUCTIONS TO BIDDERS				
Item 1.	Scope of Bid and contract performance duration	Title			
1.1	The employer supplying requirements	INF			
1.2	The name.... BDS.	INF			
Item 2.	Source of Funds	Title			
.....					

Note:

-The Bidder shall base on the contents of the "Instructions to Bidders " section of the Bidding Documents to declare the compliance with the requirements on Instructions to Bidders, Bidding Data Sheet and Bid Evaluation Criteria. Bidder shall fill in all rows "Statement of Compliance of Bidder "and use only the "Fully Compliant" (FC), "Partially Compliant" (PC) or "Non-Compliant" (NC).

- In order to prove their compliance statement, the Bidder shall indicate in the column "Reference to the Bidding Documents", the reference to which documents, items and pages in the Proposals prepared by Bidder to get the relevant information.

- If the Bidder declares "Non-Compliant" (NC) or "Partially Compliant (PC) ", please explain in column - "Note".

Form No 18.5 - Statement of Compliance to meet the requirements of Scope of supplying

No	Description	Requirement	Statement of Compliance of Bidder (FC/NC/PC)	Reference	Note
Chapter V	Technical Requirements				
Item 1.	Objectives	Title			
1.1	...	INF			
1.2	...	INF			
	Supplier responsibilities and liabilities	Title			
Item 2.					
.....					

Note:

- The Bidder shall base on the contents of the "Scope of supplying " section of the Bidding Documents to declare the compliance with the requirements on Scope of supplying. Bidder shall fill in all rows "Statement of Compliance of Bidder "and use only the "Fully Compliant" (FC), "Partially Compliant" (PC) or "Non-Compliant" (NC).
- In order to prove their compliance statement, the Bidder shall indicate in the column "Reference to the Bidding Documents", the reference to which documents, items and pages in the Proposals prepared by Bidder to get the relevant information.
- If the Bidder declares "Non-Compliant" (NC) or "Partially Compliant (PC) ", please explain in column - "Note" .

Form No 18.6-Statement of Compliance to meet the requirements of General Conditions of Contract, Specific Conditions of Contract and Contract Form

No	Description	Requirement	Statement of Compliance of Bidder (FC/NC/PC)	Reference	Note
Chapter V	Technical Requirements				
Item 1.	Objectives	Title			
1.1	...	INF			
1.2	...	INF			
Item 2.	Supplier responsibilities and liabilities	Title			
.....					

Note:

- The Bidder shall base on the contents of the "General Conditions of Contract, Specific Conditions of Contract and Contract Form " section of the Bidding Documents to declare the compliance with the requirements on General Conditions of Contract, Specific Conditions of Contract and Contract Form. Bidder shall fill in all rows "Statement of Compliance of Bidder "and use only the "Fully Compliant" (FC), "Partially Compliant" (PC) or "Non-Compliant" (NC) .
- In order to prove their compliance statement, the Bidder shall indicate in the column "Reference to the Bidding Documents", the reference to which documents, items and pages in the Proposals prepared by Bidder to get the relevant information.
- If the Bidder declares "Non-Compliant" (NC) or "Partially Compliant (PC) ", please explain in column - "Note".

Form No 18.7-Statement of Compliance to meet the requirements of Technical requirement

No	Description	Requirement	Statement of Compliance of Bidder (FC/NC/PC)	Reference	Note
Chapter V	Technical Requirements				
Item 1.	Objectives	Title			
1.1	...	INF			
1.2	...	INF			
	Supplier responsibilities and liabilities				
Item 2.		Title			
.....					

Note:

- The Bidder shall base on the contents of the "Technical requirement" section of the Bidding Documents to declare the compliance with the requirements on Technical requirement. Bidder shall fill in all rows "Statement of Compliance of Bidder "and use only the "Fully Compliant" (FC), "Partially Compliant" (PC) or "Non-Compliant" (NC).
- In order to prove their compliance statement, the Bidder shall indicate in the column "Reference to the Bidding Documents", the reference to which documents, items and pages in the Proposals prepared by Bidder to get the relevant information.
- If the Bidder declares "Non-Compliant" (NC) or "Partially Compliant (PC) ", please explain in column - "Note".

Form No. 19 List of Domestic Production Cost for Preferential Goods**List of Domestic Production Cost for Preferential Goods**

No.	Good name	Value
1	Good No.1	
	Bid price stated in the bid	(I)
	Value of taxes (included imported tax for components, parts/modules need to produce the good, VAT and other taxes has to pay for good)	(II)
	All import costs imposed on good, including fee, charges (if any)	(III)
	Domestic production costs	$G^* = (I) - (II) - (III)$
	Ratio (%) of domestic production cost	$D (\%) = G^*/G (\%)$ Where $G = (I) - (II)$
2	Good No.2	
	...	
n	Good No. n	

Legal representative of Bidder
[name, title, sign and stamp]

Notes:

- Goods not subject to get the preferential duties shall not be completed this form. Bidder shall prepare any documentary evidence to prove that such tax amount and all import cost listed above had been paid on goods.

TABLE OF SUPPLY PROGRESS

The contractor proposes the supply progress in accordance with the request of The employer

No	List of goods	Unit	Volume	Location	The delivery date		The delivery date proposed by contractor (Specify the total days from the total days from the Contract Effective Date)
					The earliest delivery date (Specify the total days from the Contract Effective Date)	The latest delivery date (Specify the total days from the Contract Effective Date)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	HSS system	system	1	HNI/HCM	7	The Contractor shall proactively arrange the delivery schedule to ensure the timely achievement of the PAC	

- All shipments to End-User's Project Sites (installation site): In line with the implementation and technical acceptance of the entire HSS system within 266 days.

- The time plan for PAC issuing: within 280 days from the contract effective date (266 days for technical acceptance + 14 days for completing documentation and issuing the PAC).

- The time plan for Network stabilization 60 days from the PAC Date.

- The time plan for FAC issuing: within 25 days after the Contractor's presentation of the Certificate of Network stabilization completion.

- Total Implementation Time: 365 days excluding the warranty period.

Note:

- Column 8: The contractors specify

PART 2. TECHNICAL REQUIREMENTS

CHAPTER V. TECHNICAL REQUIREMENTS

1. Technical Requirements

1.1. General Introduction to the Project:

- Name of the project: HSS System Capacity Enhancement
- Project implementation site: In Hanoi and Ho Chi Minh City.
- Investment Objectives: Enhancing system capacity to meet the growth demand of VoLTE services; modernizing equipment that has reached End-of-Support (EoS) from the vendor to minimize risks to service quality during operation and maintenance.
- Investment Scale and Capacity:
 - + Adding hardware and software capacity to meet the following requirements:
 - Add 1.7M software capacity and 2.5M hardware capacity for active IMS subscribers. Total system capacity post-project: 17.5M software capacity and 25M hardware capacity for active IMS subscribers.
 - Add hardware capacity to support 9M registered IMS subscribers. Total post-project capacity to support 31M hardware capacity for registered IMS subscribers.
 - Add UPG and PG node capacity corresponding to the growth of IMS subscribers
 - + Modernizing CUDB and UPG hardware (GEP5 series):
 - Migrating supplementary service synchronization functions to a virtualization platform using new hardware.
 - Synchronizing software for all elements and functions within the HLR/HSS system.

Accompanying services include: survey, technical design, installation, configuration, construction insurance, network integration and connection, testing and measurement, acceptance, training, warranty and technical support for a period of twenty-four (24) months from the date of signing the FAC (Final Acceptance Certificate).

- Project implementation period: 2026-2028
- Name of the procurement package: Engineering, Supply, and Installation of HSS System Equipment.
 - + Source of funds: Depreciation of fixed assets
 - + Bidding method: International open bidding
 - + Bid evaluation procedure: Single-stage, two-envelope process
 - + Contract type: Lump-sum contract
 - + Contract implementation period: 365 days and warranty period of 24 months

1.2. Technical Requirements

The technical requirements include general technical requirements and detailed technical requirements applicable to the goods under the scope of supply of the bidding package, specifically as follows:

SECTION 1. SCOPE AND DELIVERY

Item	Content	Max. Scores	Min. Scores	Note
1	INSTRUCTIONS			
1.1	This document indicates the scope of supply providing VNPT-Net with HLR/HSS capacity/systems that have the capacity of 1.7 M software/license and 2.5M hardware HSS-IMS active subscribers, 9M HSS-IMS hardware provisioning subscribers; The existing GEP5 hardware shall be modernized/replaced by latest hardware platform on which native cloud shall be offered and deployed.			INF
1.2	Bidder shall take full responsibility for integrating the offered capacity/system with VNPT-Net's existing network.			INF
1.3	The Bidder must regard this document as a request to design and submit the proper and feasible bid to VNPT-Net in order to fully comply with the requirements.			INF
1.4	The Bidder must take full responsibility for any items that have been committed providing but not work.			INF
1.5	The Bidder must quote for a full turn-key solution in which Bidder, be fully responsible for installation, commissioning, integration and project management. All of these requirements must be clearly shown on the Bidder's quotation.			INF
1.6	All necessary hardware, licensed software/ features, accessories and related services, all installation materials and accessories such as cables, cable tray etc. needed for the installation and integration of the system shall be full turn-key based and must be included in Bidder's Bidding Price and detailed in the Bidder's Bill of Quantity (BoQ).			INF
1.7	In addition to the State of Compliance to VNPT-Net requirements, the Bidder clearly submits the Scope of Works, System Design with the proper calculation on dimensioning taking into account the input requirements that VNPT-Net indicates.			INF
1.8	The Bidder must show system description (hardware, software, features...) in details.			INF
1.9	Items throughout this chapter must be answered in writing and explained clearly.			INF
1.1	The bidder shall base on the details in this document to specify the proposed products.			INF
1.11	The bidder has to commit complying with each item by filling "FC" (Full Compliance) for the item.			INF
1.12	The bidder can provide further information to clarify the answers. The information can be either an explanation or references in the bid document.			INF
1.13	VNPT-Net will dismiss the entire proposal if any response is filled with "NC" (No Compliance) or not acceptable or assessed as not compliant.			INF
1.14	Without explanation or references to a requirement in the bid document, the bidder could get 0 scores for that requirement.			INF
1.15	The Bidder's writing should be in English and in a size larger than 10pt.			INF
1.16	In order to be easier for VNPT-Net to consider the proposed product, a soft copy of the bid document is required.			INF

2	SCOPE OF SUPPLY REQUIREMENTS	400	355	
	This Procurement Package is on the basis of EPC Procurement Package. Bidder shall take full responsibility in implementing project from the beginning to the end that includes three major contents:			INF
	E - Engineering and Designing.			INF
	P - Procuring and Product Supplying.			INF
	C - Installation and Commissioning.			INF
	VNPT Net requirements (covering all three contents) for equipment purchasing under this procurement package are detailed here below:			INF
2.1.	E - REQUIREMENTS FOR ENGINEERING AND DESIGNING	90	71	
	The entire requirements on Engineering and Designing services specified in this chapter must be included in the total bid price submitted by bidders.			INF
2.1.1	Reference list	15	0	
2.1.1.1	The similar solution must be provided for, deployed in at least one mobile operator in the world.	15	0	
2.1.2	Product roadmap and upgrade path	15	10	
2.1.2.1	The Bidder is required to provide the manufacturer's product roadmap stating version of the proposed system at least for 5 years.	5	0	
2.1.2.2	The Bidder shall explain the upgrade path of the proposed system to a higher version in a manner that most of the components offered can be reused.	5	0	
2.1.2.3	The Bidder shall have a manufacturer's official document to confirm to develop the offered product for at least 7 years.	5	5	
2.1.3	PRE-INSTALLATION AND SITE SURVEYING	20	15	
2.1.3.1	Bidders must carry out all the necessary site surveying (including: site survey, electrical survey, existing VNPT network survey) in order to collect enough information to implement this project. The pre-installation site surveying includes: - Site location survey; - Existing VNPT's HLR/HSS system with all the services/features which it has the capability of; - Installation plan (floor plan, network integration plan, etc.)...	5	5	
2.1.3.2	Installation plan including network integration, equipment floor plan must be submitted to VNPT Net for approval before implementation. VNPT Net will assist in addressing the site and providing as much information as we can to the Bidders.	5	0	
2.1.3.3	Bidders are requested to provide the detailed implementation schedule, scope of work, and other necessary conditions for installation and testing of the proposal system.	5	0	

2.1.3.4	The Bidder shall do the survey to have good understanding about VNPT's network to make sure that the proposed system shall be integrated, interworked with VNPT's existing network successfully. And VNPT is ready to support Vendor to survey the existing network and the HLR/HSS system: Services; Voice, SMS, data, value added services...; online and offline charging; architecture: frontend, backend, provisioning... systems; technical features; provisioning system; Customer care; interfaces for connecting to surrounding Core nodes, IT system, SMSC, SPS system And the Bidder shall commit that the existing HLR/HSS systems, all the features, services.... are well understood.	5	5	
	ENGINEERING DESIGNING			INF
2.1.4	Dimensioning and designing the system			
2.1.4.1	The HLR/HSS dimensioning criteria that Bidder must take it into account to make proper dimensioning for the proposed system (including hardware, software, processing capability....) are specified here below:	40	40	
2.1.4.1.1	The proposed system's capacity design must allow utilizing the maximum licensed capacity of every nodes while average hourly CPU/vCPU load under 50% and peak CPU/vCPU load under 70%, peak Memory/virtual memory/storage/virtual storage utilization under 70% and average hourly Memory/virtual memory/storage/virtual storage utilization under 65% during the Busy Hours;	5	5	
2.1.4.1.2	The redundancy for VNFCs, CNFCs must be $N+k$ ($k \geq 1$); The redundancy for physical servers in a NFVI/cloud infrastructure must be at least $N+1$ in each data center; the proposed system must be designed, sized with sufficient hardware resources and the upgrade shall be done without service interruption.	5	5	
2.1.4.2	The Bidder must base on the requirement specified in this part to design the system accordingly. Details of system design with dimensioning, configuration and module must be documented and submitted with the bid. The Bidder shall provide sizing methods the offered equipment in his solution, including assumptions and formulas to make consistent results. Bidder shall provide detailed documents relating to the processing ability of the elements in the solution (card, board, server...).	5	5	
2.1.4.3	Every component of the proposed system shall be broken down and showed in the quotation list.	5	5	
2.1.4.4	The supplier shall provide IP networking equipment - routers and switches - for sites needed in order to connect its components to VNPT-Net IP network. The IP equipment shall have 1+1 redundant configuration. The provided equipment shall not cause any trouble for VNPT-Net.	5	5	
2.1.4.5	The proposed, existing software license shall be able to be transferred, relocated or reused between new VNF/CNFs/Node functions, Cloud infrastructure, and the coming and existing VNPT's system of the same vendor. The Vendor shall be responsible for the license transfer at no cost for VNPT's commercial deployment.	5	5	

The traffic profile and assumptions used for sizing the proposed capacity/system shall be (for the whole system):																																																																																																															
	<table><tr><th colspan="4">Inputs for UDC Solution</th></tr><tr><th>General system requirements</th><th></th><th></th><th>Requirement</th></tr><tr><td>Average CPU load of each sub system in busy hour with required traffic profile</td><td>%</td><td></td><td>≤ 65%</td></tr><tr><td>Peak CPU load and memory utilization of each sub system in busy hour with required traffic profile</td><td>%</td><td></td><td>≤ 70%</td></tr><tr><td>IP link utilization</td><td>%</td><td></td><td>≤ 50%</td></tr><tr><td>Signaling link utilization</td><td>%</td><td></td><td>≤ 20%</td></tr><tr><td>vHSS-FE (IMS)</td><td></td><td></td><td>Parameter Value Considered</td></tr><tr><td>Initial registration STANDARD</td><td># ev/ subs</td><td></td><td>0.05</td></tr><tr><td>Re-registration STANDARD</td><td># ev/ subs</td><td></td><td>1.87</td></tr><tr><td>Percentage of fixed BB users</td><td>%</td><td></td><td>50%</td></tr><tr><td>vHSS-FE (EPC)</td><td></td><td></td><td></td></tr><tr><td>Percentage of LTE users with IMS subscription</td><td>%</td><td></td><td>100%</td></tr><tr><td>Handheld User Percentage</td><td>%</td><td></td><td>90%</td></tr><tr><td>Laptop User Percentage</td><td>%</td><td></td><td>10%</td></tr><tr><td>Initial Attach</td><td>#ev./ user</td><td></td><td>0.36</td></tr><tr><td>Inter MME</td><td>#ev./ user</td><td></td><td>0.03</td></tr><tr><td>Intra MME</td><td>#ev./ user</td><td></td><td>0.26</td></tr><tr><td>IRAT HO 3G --> LTE</td><td>#ev./ user</td><td></td><td>1.7</td></tr><tr><td>IRAT HOLTE --> 3G</td><td>#ev./ user</td><td></td><td>1.7</td></tr><tr><td>Service Request</td><td>#ev./ user</td><td></td><td>6.95</td></tr><tr><td>Detach</td><td>#ev./ user</td><td></td><td>0.12</td></tr><tr><td>2G/ 3G and LTE mobility management users</td><td>%</td><td></td><td>100%</td></tr><tr><td>External USIM auth. via AVG - HLR/ AUC</td><td>hlr/ avg</td><td></td><td>hlr</td></tr><tr><td>Back-end database</td><td></td><td></td><td></td></tr><tr><td>No. of sites</td><td>Value</td><td></td><td>2</td></tr><tr><td>Redundancy</td><td>1+1 or 1+1+1</td><td></td><td>1+1</td></tr><tr><td>Relation AUC subscribers to HLR subscribers</td><td>Ratio</td><td></td><td>1:01</td></tr></table>	Inputs for UDC Solution				General system requirements			Requirement	Average CPU load of each sub system in busy hour with required traffic profile	%		≤ 65%	Peak CPU load and memory utilization of each sub system in busy hour with required traffic profile	%		≤ 70%	IP link utilization	%		≤ 50%	Signaling link utilization	%		≤ 20%	vHSS-FE (IMS)			Parameter Value Considered	Initial registration STANDARD	# ev/ subs		0.05	Re-registration STANDARD	# ev/ subs		1.87	Percentage of fixed BB users	%		50%	vHSS-FE (EPC)				Percentage of LTE users with IMS subscription	%		100%	Handheld User Percentage	%		90%	Laptop User Percentage	%		10%	Initial Attach	#ev./ user		0.36	Inter MME	#ev./ user		0.03	Intra MME	#ev./ user		0.26	IRAT HO 3G --> LTE	#ev./ user		1.7	IRAT HOLTE --> 3G	#ev./ user		1.7	Service Request	#ev./ user		6.95	Detach	#ev./ user		0.12	2G/ 3G and LTE mobility management users	%		100%	External USIM auth. via AVG - HLR/ AUC	hlr/ avg		hlr	Back-end database				No. of sites	Value		2	Redundancy	1+1 or 1+1+1		1+1	Relation AUC subscribers to HLR subscribers	Ratio		1:01	5	5
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2.1.4.6																																																																																																															
2.1.4.7	The HSS-EPC active subscribers shall be considered as, dimensioned using the attached subscribers in MMEs, and the HSS-IMS active subscribers shall be considered as, dimensioned using the registered subscribers in CSCF of the IMS system. The provisioning subscribers shall be the ones that are provisioned in the HLR/HSS system and ready for customers to use the services		5																																																																																																												
2.2	P - REQUIREMENTS FOR PROCURING AND PRODUCT SUPPLYING		90																																																																																																												
2.2.1	SCOPE OF SUPPLYING:		65																																																																																																												
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2.2.1.1	VNPT Net, an incumbent, integrated telecom operator in Vietnam, is now planning to adding an additional HLR/HSS capacity/system in order to provide services for data & IMS/VoLTE/VoWifi subscribers. The scope of supplying includes: HLR/HSS system to be deployed in 2 region centers (HaNoi, HoChiMinh). The OAM/OSS system, cloud infrastructure management shall be included	5	5	
2.2.1.2	The Bidder shall supply spare parts, accessories for complete installation and put the system into operation	5	5	
2.2.1.3	The Bidder shall provide service for installation, commission, acceptance test and at least 02 years warranty service.	5	5	
2.2.1.4	The HLR/HSS system shall be deployed based on the cloud technology which shall be merged into the coming cloud infrastructure of VNPT and be ready for 5GC deployment. Bidder must commit to delivery products that are able to be merged into the later cloud of VNPT. The solution, design must be well described in detail for the validation.	5	5	
2.2.1.5	The proposed system shall include VNF/CNF management, Virtualization infrastructure management (VIM)/Container Infrastructure Service Manager (CISM), Element management which shall include all licenses and functions. All the modules: VNF-M, VIM, CISM, NFVI, EM, VNF, CNF... shall support open interfaces for the integration with each other and with orchestration module/layer which will be deployed later.	5	5	
2.2.1.6	The OSS system for the proposed HLR/HSS shall be provided and deployed in Hanoi site. Vendors can make use of existing available infrastructure OSS system of Mobile Core System in VNPT network to optimize and simplify network operation purpose.	5	5	
2.2.1.7	The offer shall include training for operation and maintenance of the system and new technology update.	5	5	
2.2.1.8	Workstation for operation and maintenance: the minimum quantity and configuration of desktop shall be included in the offer: 02 desktops (CPU core i7 equivalent or higher, hard disk 2TB SSD, RAM 32GB, Monitor 21 inch, windows license included).	3	3	
2.2.1.9	Workstation for operation and maintenance: the minimum quantity and configuration laptop shall be included in the offer: 05 laptop (CPU core i7 equivalent or higher, harddisk SSD 1T, RAM 16G DDR5; windows license included).	2	0	
2.2.1.10	Based on the VNPT-Net's traffic model and the existing HLR/HSS system, the proper dimensioning for the proposed system/capacity must be done to meet the minimum required system/capacity as follows: Active subscribers: - 1.7M Software, 2.5M Hardware HSS-IMS active subs; Provisioning subscribers: - 9M IMS provisioning subs (hardware capacity); Provisioning gateway: - 9M IMS provisioning subs (hardware capacity); VoLTE supplementary service synchronization system: 1.7M IMS active subs. Latest hardware including native cloud platform for modernizing/replacing existing GEP5 hardware of the VNPT's	5	5	

HLR/HSS system shall be provided. All the existing software/license capacity served by platform/system using GEPS hardware shall be transferred/relocated to the offered system/capacity.

Content	Hà Nội Site	TP HCM Site	Requirement
HSS FE			
HSS-DMS Hardware Capacity (active subscribers, Sites)	2.5	2.5	1-1 active-active pair redundancy, each node VNF CNF in a pair shall have sufficient hardware and software capacity to take over the whole traffic of the pair in case 1 node CNF/VNF in that pair is faulty or the VNF CNF shall be integrated into existing VNPT HSS-FE pool in HNL HCM to create local pool.
HSS-DMS software License Capacity (active subscribers, in million)	1.7	1.7	
	Distribute between Hà Nội and Hồ Chí Minh City		
	1	1	
CNF/VNF	1	1	
Back-End			
HSS-DMS Hardware Capacity (provisioning Sites)	9	9	1-1 active-active pair redundancy; VNPT's existing license shall be relocated/transferred to the provided system capacity or the license may be provided in a manner that is equivalent to the hardware capacity. (*) The provided hardware capacity can be done by expanding the VNPT's existing BE system to make a unified system.
	1	1	
VNF CNF (*)	1	1	
Provisioning GW			
HSS-DMS HW Capacity (M provisioning Sites)	9	9	1-1 active-active pair redundancy; VNPT's existing license shall be relocated/transferred to the provided hardware system capacity or the license may be provided in a manner that is equivalent to the hardware capacity. (*) The provided hardware capacity can be done by expanding the VNPT's existing Provisioning gateway system to make a unified system.
	1	1	
VNF CNF (*)	1	1	
VoLTE supplementary service synchronization Function			
HW Capacity (active subscribers, in million)	1.7	1.7	1-1 active-active pair redundancy, each node VNF CNF in a pair shall have sufficient hardware and software capacity to take over the whole traffic of the pair in case 1 node CNF in that pair is faulty.
Software License capacity (active subscribers, in million)	1.7M	1.7M	
	Distribute between Hà Nội and Hồ Chí Minh City		
	1	1	(*) The provided capacity can be done by expanding the VNPT's existing Supplementary service synchronization function to make a unified system.
Sites	1	1	
CNF/VNF (*)	1	1	
Back-End Modernization			
HW Capacity (provisioning subscribers, in million)	60M 2G 3G-40M 4G-10M DMS; 5M AAA-40M SPR	60M 2G 3G-40M 4G-10M DMS; 5M AAA-40M SPR	1-1 active-active pair redundancy, each node CNF in a pair shall have sufficient hardware and software capacity to take over the whole traffic of the pair in case 1 node CNF in that pair is faulty.
Sites	1	1	
VNF CNF (*)	1	1	
VoLTE supplementary service synchronization Function Modernization			
HW Capacity (active subscribers, in million)	15.8M		VNPT's existing license shall be relocated/transferred to the provided hardware system capacity; Alternatively the license shall be provided to match the hardware capacity.
Sites	1		
VNF CNF	1		

2.2.1.1.1	With the addition capacity/system required in item 2.2.1.9, the new HLR/HSS system of VNPT with the total minimum capacity after the completion of this project must be:				
	Function	Target Capacity (subscribers)	Capacity Expansion (subscribers)	VN/CNF Redundancy After Project	
	Back-end (provisioning subscribers, In million - M)	60M 2G/3G, 40M 4G EPC, 22M SW/31M HW DNS, 2.8M IoT, 5M AAA, 40M SPR, 3.5M 5G NSA		1-1 active-active pair redundancy, each node VNF CNF in a pair shall have sufficient hardware and software capacity to take over the whole traffic of the pair in case 1 node CNF in that pair is faulty. The backend system (including all hardware and software components) shall be designed and provided sufficient capacity to ensure stable and reliable operation in alignment with the frontend system capacity.	
	HSS Front-end (active subscribers, In million - M)	HW HSS EPC ; 17.5M SW license and 25M HW HSS	9M DNS (hardware capacity) 1.7M SW/2.5M HW HSS DNS	New VNF/CNF in a region shall support 1+1 Geo-redundancy with new CNF/VNF in other region, or they shall be integrated into VNPT's existing HSS-TE pools.	
	HLR Front-end (active subscribers, In million - M)	24M 2G/3G	N/A	1-1 active-active pair redundancy in each region HNI and HCM. Each node VNF CNF in a pair shall have sufficient hardware and software capacity to take over the whole traffic of the pair in case 1 node CNF in that pair is faulty.	
	Provisioning Gateway system (provisioning subscribers, In million - M)	60M 2G/3G, 40M 4G EPC, 22M SW/31M HW DNS, 2.8M IoT, 5M AAA, 40M SPR, 50K 5G SA, 3.5M 5G		1-1 active-active pair redundancy, each node VNF/CNF in a pair shall have sufficient hardware and software capacity to take over the whole traffic of the pair in case 1 node CNF in that pair is faulty.	
	VoLTE supplementary service synchronization (active subscribers, In million - M)	17.5M VoLTE interworking	9M DNS (hardware capacity)	New VNF/CNF in a region shall support 1+1 Geo-redundancy with CNFs in other region, or be integrated into VNPT's existing pools.	
	5GSA	50K UDR/AUSF/UDM	1.7M VoLTE interworking N/A	N/A	
	2.2.1.1.2	The proposed HLR/HSS function nodes in each region shall work in High Available redundancy mode.			5 5
	2.2.1.1.3	The proposed HLR/HSS functions (Front-end, Back-end, Provisioning system) shall support geo-redundancy mechanism. If the capacity in one site down, the remaining site shall have sufficient capacity (hardware, software license ...) to take over the traffic of the whole scope. The proposed Front-end and Back-end shall be deployed on separated Cloud infrastructure.			5 5
2.2.1.1.4	The proposed HLR/HSS shall utilize and fully compatible to existing centralized Authentication center of VNPT HLR/HSS system. The integration (if any) shall make sure no impact to existing service/function and guarantee the existing security set up of authentication data. In case the bidder can't utilize the existing AuC, the bidder shall provide new authentication center for this scope and make sure there's no impact to current traffic flow & services of subscribers.			5	5
2.2.2	Scope of supplied goods for main part of Cloud infrastructure (NFVi/Cloud native infrastructure):			10	5

2.2.2.1	Cloud infrastructure in HaNoi and Cloud infrastructure in HoChiMinh including VIM, CISM, VNF/CNF-M for HLR/HSS VNF/CNFs shall be proposed for the project based on scope of supply. They must be dimensioned with sufficient hardware and software capacity, vendor can simplify architecture by utilizing existing VNPT's infrastructure.	5	5	
2.2.2.2	VNF/CNF-M shall be provided for all cloud in this scope.	5	0	
	Bidder could reuse the VNF/CNF-M elements if existing in VNPT Network to simplify network operation purpose.			
2.2.3	Software, Features and functions	15	13	
2.2.3.1	With the additional capacity/system required in chapter V, Section 1, All the features, services as mentioned in the appendix 1 must be supported by the VNPT's HLR/HSS system after the completion of the project. Those features, services must be provided and available for VNPT's commercial deployment	6	6	
2.2.3.2	The bidder shall provide the document explaining all the basic and option features that the proposed system can support.	6	0	
2.2.3.3	The offered system shall provide all basic and optional features. Each feature shall be quoted unit price in the detailed BoQ.	5	5	
2.3	C - REQUIREMENTS FOR INSTALLATION AND COMMISSIONING	220	203	
	The entire requirements on Installation and Commissioning services specified in this chapter must be included in the total bid price submitted by bidders.			INF
2.3.1	INSTALLATION	15	15	
2.3.1.1	Hardware and Software Installation are both included in the scope of implementation service offered by bidders: - Equipment delivery to installation sites. - Installation service for all equipment.	5	5	
2.3.1.2	Installation plan must be submitted to VNPT Net one (01) month before starting and must be approved by VNPT Net.	5	5	
2.3.1.3	The proposed system shall use VNPT Net DC power supply system. The bidder shall provide the PDU (Power Distribution Unit), power cable... going along with the system offered	5	5	
2.3.2	INTEGRATION	36	28	

2.3.2.1	Integration to VNPT Net's existing network must be included in the scope of bidder implementation service.	3	3	
2.3.2.2	Integration shall let all the services, feature, function provided be tested and work successfully	5	5	
2.3.2.3	The integration with the existing VNPT's Network, the unified VNPT's HLR/HSS system after project must be done to meet at least the requirements of: - Providing a single interface toward the provisioning system; - Providing services and packages shared by a group of subscribers, the service must satisfy any subscriber and not depend on the type of network technology; - Making no changes to operations, operating scenarios, or production and business management of VNPT, ensure there is no service disturbance of existing business; - Making no changes to architecture and work flows of HLR/HSS towards other core nodes, and relevant systems; - Making no changes to the existing flows that the existing HLR HSS are using to work/handshake with the IT systems/systems of VNPT IT, VNPT Vinaphone, VNPT Media.	5	5	
2.3.2.4	The Bidder shall provide detailed information about the hardware architecture, logic architecture (describing functional components) and integration plan. The Bidder shall explain how the proposed solution support all existing features, services, integrations.	3	0	
2.3.2.5	The offered system shall support Diameter, MAP, SS7 (2G,3G,4G) and HTTP2 (5G)	5	5	
2.3.2.6	The Bidder shall provide a detailed solution, drawings, descriptions and explanations for integrating the proposed system into VNPT-Net network, connecting with MSS, EPC, IMS ... The Bidder shall explain the proposed integration framework and its capabilities to interface with external systems. The Solution shall include the following. - Purpose of integration; - Proposed schedule for integration; - Integration point & Integration topology; - Interface protocol & Application provided by the system; - Solution, which is fully compatible with existing implementation and service offerings; - Interworking with existing infrastructure. Other information (if any).	5	0	
2.3.2.7	Integration with VNPT's existing network elements (listed below): Bidder must be fully responsible and by its own cost to survey, provide mediation systems (if needed), design system, plan for Integration, negotiate, arrange the working with other existing equipment supplier, present detailed plan and schedule in order to have integration successfully done. The integration points which are suitable for HLR/HSS system's interfaces where relevant ... The existing systems are (including but not limited to):	5	5	

	- STP/DRA system provided by Oracle; - TSS/MGW/MSS/MGCF system provided by Ericsson, Nokia-Siemens; - OCS prepaid/postpaid system provided by Ericsson; - SMSC system provided by Tango and Huawei; - NMS system: the Performance Management and Fault Management (PMS & FMS of VNPT) - SPI/SPS system; - 5G SA Components: AMF, SMF - EPC system provided by Ericsson, Nokia; - HLR/HSS provided by Ericsson...				
2.3.2.8	The Bidder shall take full responsibility and bear costs for integrating the proposed systems with the existing VNPT entities (existing network, Core, OSS/BSS) which are currently use in VNPT.	5	5	5	
2.3.3	ACCEPTANCE TEST AND COMMISSIONING	12	10		
2.3.3.1	After finishing installation and integration, the bidder must take responsibility in carrying out the acceptance test and commissioning. The acceptance test procedure and plan must be agreed between VNPT Net and bidder before implementation on the site. The acceptance test needs to be carried out with the attendance of VNPT Net representative.	3	3		
2.3.3.2	The bidder shall use his own test equipment during the installation and commissions of the proposed system. The Bidder must have sufficient tools and equipment to have all functions and features tested successfully.	5	5		
2.3.3.3	The bidder shall include an acceptance test document in the bidding document and show test cases for: - Showing the capacity of the hardware, software that meets the requirement; - System services, features, functions purchased	4	2		
2.3.4	MIGRATION	22	20		
2.3.4.1	The bidder shall be fully responsible and by its own cost to design system, negotiate, arrange the working with other existing equipment supplier in order to migrate successfully.	3	3		
2.3.4.2	The Bidder shall responsible and bear costs for the migration of all relevant data needed in order to support all existing subscribers, services and business processes of VNPT-Net. The bidder shall take all responsibility on data migration and cleansing ensuring no data loss during the migration period.	5	5		

2.3.4.3	The bidder shall be in charge of migrating (moving/load balancing) subscribers from existing HLR/HSS system to new system base on scope of supply. The bidder shall describe the detail subscribers' migration/movement procedure (i.e: extraction, transformation, loading, cleansing, rollback, post-migration... where relevant).	5	5	
2.3.4.4	The Bidder shall describe the tools, methodology and capabilities provided in the solution to enable data migration from the current systems. The Bidder shall describe the data migration related tools, hardware requirement and how to utilize the equipment or tools for the normal operation. The Bidder shall describe life cycle of migration activities (i.e: extraction, transformation, loading, cleansing, rollback, post-migration... where applicable).	4	2	
2.3.4.5	The Bidder shall restore to any previous phased migration when the performance of proposed system lower than daily KPIs	5	5	
2.3.5	TIME FRAME FOR CONTRACT EXECUTION	10	10	
2.3.5.1	VNPT Net do not accept any traffic disturbance faults that should happen during the time when the acceptance test is being done. All remaining, minor and 3rd party faults must be fixed and accepted by VNPT Net within 4 weeks, otherwise the acceptance tests for the node have to be re-done again from the beginning.	5	5	
2.3.5.2	Key contract timelines: - All shipments to End-User's Project Sites (installation site): In line with the implementation and technical acceptance of the entire HSS system within 266 days. - The time plan for PAC issuing: within 280 days from the Contract Effective Date (266 days for technical acceptance + 14 days for completing documentation and issuing the PAC). - The time plan for Network stabilization 60 days from the PAC Date. - The time plan for FAC issuing: within 25 days after the Contractor' presentation of the Certificate of Network stabilization completion.	5	5	
2.3.6	WARRANTY PERIOD	5	5	
2.3.6.1	For all the system supplied under this project, VNPT Net request for a minimum warranty of twenty four (24) months counting from the date of issuing Final Acceptance Certificate Date (FAC). The warranty period is applied for all hardware, software, features, functionalities and capacity purchased under this project.	5	5	
2.3.7	TECHNICAL SUPPORT DURING WARRANTY TIME	55	55	
2.3.7.1	Bidders must provide on-site support engineers for the implemental equipment belonging to this tender.	5	5	

2.3.7.2	The CSR support shall include the scope of supporting the integration with the new nodes, new functions to come of VNPT.	5	5	
2.3.7.3	The Customer Service Request (CSR) Handling is required. Under its CSR Handling service, bidder must provide at any time a proper following of the different service requests VNPT Net sends.	5	5	
2.3.7.4	Emergency Support and Severity Level 1 Support If the defect, problem and/or disturbance is of such a nature that VNPT Net cannot remedy the defect, problem and/or disturbance and get the system back in operation and Commercial Service by following instructions given by bidder through Telephone Support, or bidder, for reasons attributable to bidder, cannot provide VNPT Net with a temporary solution enabling VNPT Net to put the system back into operation and Commercial Service without visiting the relevant Site, bidder must provide On-Site Support. Bidder's system expert must in such a case be on site in 30 minutes counted from the confirmation of VNPT Net about the unsuccessful recovery.	5	5	
2.3.7.5	Severity Level 2 and 3 Support. VNPT Net notify bidder of a Severity Level 2 or 3 defects or a problem related to the system through a call to bidder. Bidder must, within a maximum time period of thirty (30) minutes (for Level 2) and forty-five (45) minutes (for level 3) from the moment when VNPT Net has made the above mentioned call to the appointed telephone numbers, make a call back to VNPT Net in order to receive all information related to the defect, problem and/or disturbance from VNPT Net necessary in order for bidder to find a temporary solution and provide VNPT Net with instructions. Relevant data regarding Hardware/Software or Documentation must be submitted by VNPT Net to bidder separately in writing. A CSR will be opened and bidder will respond with an answer within the time-limit set forth below with appropriate information about the reported defect or problem.	5	5	
2.3.7.6	Definition of Emergency and Severity Levels: Emergency: Emergencies are applicable for the failures seriously affecting the systems in operation, that means the enormous effects to VNPT's business that require immediate action. The following situations are classified as severity level emergency: - a complete system failure; - a failure in the system's functionality resulting in a capacity decrease of from 10% of the system's total capacity in the serving area; - a complete loss or major disturbance of the network management system; - a complete loss of I/O of the systems in operation... Severity Level 1 (High): A serious defect in the system which is causing the system or a major feature therein to become inoperative, or severe performance degradation, or situations that may result in emergencies. Major problems or disturbances that require immediate action. The following situations are examples of the request type "High":	5	5	

	• loss of redundancy of a critical part of the system; • a disturbance affecting the revenue; • a disturbance affecting the network management system; • a severe problems or disturbances affecting a specific functionality or a part of the system but not the whole system; • a serious degradation of the system's performance; • system have to be restarts or reload; • frequent (but not constant) system crashes; • a disturbance affecting communication with other operators... Severity Level 2 (Medium): A defect in a part of the system which is causing the system or a major feature therein to become disturbed or frequently interrupted or a performance degradation, service degradation or loss of capability in relation to such part of the system or such major feature therein. Such defect could also result in faults affecting proper operation or maintenance, or results in a system performance degradation that may result in customer complaints or significantly increased maintenance workload on VNPT's staff. The following situations are examples of the request type "Medium": • severe problems or disturbances affecting the system's performance or system's services partially; • small scale/minor restart of the system; • system still in operation but however some faults existing such as high-workload or a special supervise in operation needed... Severity Level 3 (Low) A minor defect in the system not affecting the performance, service or operation and maintenance of the system but however resulting in a deviation from the System Specification. General queries and/or minor problems relating to the product functions/features. The examples are: - minor disturbances that do not affect traffic or causes any loss of service but however resulting in a deviation from the System Specification; - minor documentation errors not affecting operation and maintenance of the system; - some incorrect print-outs...		
2.3.7.7	Consultations and Technical Requests: The Consultations and Technical Requests service – for non-emergency questions – allows VNPT Net to ask questions on operation and maintenance. The vendor has to provide VNPT Net with Technical Support Information Sharing that the vendor shares their maintenance and operation experience, the experience of risk prevention, etc. with VNPT Net.	5	5
2.3.7.8	Software Correction Update: The Contractor must continuously provide the Purchaser with Software Updates and Software Corrections approved from the design department within Contractor for the period of five years after expiry of warranty period.	5	5

2.3.7.9	Hardware Repair and Replacement service: For the warranty period, components that are broken during the operation must be replaced, faulty parts including the 3rd party's (if there is) have to be repaired and returned to Vietnam on time. The repaired-cards must be warranted in 1 year counted from the day when Bidder finishes the repair and transfer them to VNPT Net if the warranty period of the project expired. The duration of repair shall not exceed 60 days from Date of Notice from VNPT Net to the time when VNPT receive the repaired-hardware back. And for a period of seven (07) years from the Acceptance Certificate (AC) Date (and the warranty time is over), unit price of repair and return shall not be higher than 50% unit price stated in the Contract even in case new technology and/or new functionalities are introduced. In case some of the faulty cards/server are major ones which can effect the commercial operation of the network and the Buyer does not have enough spare parts, Bidder shall support Buyer in 24 hours by letting Buyer borrow the needed cards/servers. The Bidder must have the spare part for major equipment available in Vietnam.	5	5	
2.3.7.10	The on site support shall be required on special holidays: New year : 01 day; Lunar new year: 3 days; Celebration of Hung King's day: 1 day; Liberation and May day: 2 days; National day: 1 day; Special event: 2 days. Those support days can be flexibly assigned for different mentioned/other events depending on the VNPT's demand, but the total number of days shall be unchanged	5	5	

The CSR support which shall include supporting integration with the new nodes to come of VNPT shall be required as below:						
Detailed CSR commitment time:						
Service Items		SLA				
		Service Availability Period	Response Time	Restoration Time/ Workaround Time	Resolution Time (without defect- software correction)	Resolution Time (with defect- software correction)
Helpdesk	Helpdesk Interface	5 × 8	N/A			
	Non-fault Enquiry (Consultation)	5 × 8	120 min	For Non-Fault Enquiry, provide answer in 10 CD		
CSR (Customer Service Request) for OAM	Severity Level 1	7 × 24	15 min	4 hours	1 CD	7 CD
	Severity Level 2	7 × 24	30 min	1.5 CD	7 CD	40 CD
	Severity Level 3	5 × 8	45 min	6 CD	30 CD	75 CD
Target precision for CSR per quarter		95%				
Online Support		7 × 24, website				

2.3.8	TECHNICAL SUPPORT AFTER WARRANTY TIME	15	15																										
2.3.8.1	Bidder is requested to quote Technical support service after warranty for 1-year period as an option. The quotation for Technical support service after warranty shall be a factor in Evaluated Bid Price (Section III- Evaluation and Qualification Criteria). Technical support service after warranty must cover all the scope as required in item 2.3.7 (with the CSR/SLA stated in item 2.3.8) AND the scope specified in the Technical support service for core network currently applied for VNPT Net. The Bidder shall break down unit price for each item per year and explanation for the option, the solution(s) as well as all items.	5	5																										
2.3.8.2	The software upgrade and update for the provided system including cloud infrastructure elements must be offered . The software upgrade, update shall include software, services to make the system upgraded, updated and commercially deployed. The time period for upgrade shall be once every 12 months.	5	5																										
2.3.8.3	Service Level Agreement (SLA) in the Technical support service is requested not lower than as specified bellowed: <table><tr><td>Support Service</td><td>Target Precision</td><td>Temporary Restoration Time</td><td>Complete Restoration Time</td><td>Response Time</td></tr><tr><td rowspan="2">Emergency</td><td>98%</td><td>4 hours (24x7)</td><td>24 hours (24x7)</td><td rowspan="2">15 min (24x7)</td></tr><tr><td>100%</td><td>12 hours (24x7)</td><td>48 hours (24x7)</td></tr><tr><td rowspan="2">High Level Severity</td><td>98%</td><td>48 hours (working time)</td><td>1 week</td><td rowspan="2">1 hour (working time)</td></tr><tr><td>100%</td><td>72 hours (working time)</td><td>2 weeks</td></tr><tr><td>HW Repair & Replacement</td><td>95%</td><td colspan="3">60 days (working day)</td></tr></table>	Support Service	Target Precision	Temporary Restoration Time	Complete Restoration Time	Response Time	Emergency	98%	4 hours (24x7)	24 hours (24x7)	15 min (24x7)	100%	12 hours (24x7)	48 hours (24x7)	High Level Severity	98%	48 hours (working time)	1 week	1 hour (working time)	100%	72 hours (working time)	2 weeks	HW Repair & Replacement	95%	60 days (working day)			5	5
Support Service	Target Precision	Temporary Restoration Time	Complete Restoration Time	Response Time																									
Emergency	98%	4 hours (24x7)	24 hours (24x7)	15 min (24x7)																									
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High Level Severity	98%	48 hours (working time)	1 week	1 hour (working time)																									
	100%	72 hours (working time)	2 weeks																										
HW Repair & Replacement	95%	60 days (working day)																											
2.3.9	SPARE PART	10	10																										
2.3.9.1	The Bidder shall be prepared to supply spare parts of the Supplies which are compatible in form, fit and function for a period of seven (07) years from the AC date. The price of spare parts will be negotiated between the Buyer and the Bidder, but should not be higher than the discounted unit price of the Contract. If after seven (07) years period the Bidder tends to discontinue the manufacture of any parts of the supplies under this contract, the Bidder shall give notice to the Buyer at least 01 year prior to this discontinuation. The Bidder shall offer the Buyer an opportunity to order at reasonable price such quantities of replacement parts as the Buyer may reasonably require in relation to the anticipated life of the supplies	5	5																										
2.3.9.2	The Bidder shall provide spare parts for the system. The spare parts must be at least 5% of the total hardware value of the offered system and the number of computes, switching fabric router/switches as spare must not be less than two and one respectively.	5	5																										

2.3.10	ORIGIN OF EQUIPMENT	10	10
2.3.10.1	Equipment, including hardware and software, supplied under this project and bid to VNPT-Net must be 100% new and is the latest-of-art production of bidder.	5	5
2.3.10.2	Bidder must provide Certificate of Origin and Certificate of Quality from hardware vendor when providing the hardware to VNPT-Net.	5	5
2.3.11	TRAINING	20	15
2.3.11.1	At least 1 (one) training course must be offered with trainees which are VNPT Net staff. Knowledge: theory about system operation and maintenance, including service layer and infrastructure layer; The trainees shall be transferred knowledge and after the training, the trainees shall have sufficient knowledge of understanding to operate and maintain the proposed system, including the infrastructure offered in the project. Trainees shall be trained and have good skill and knowledge after the training. Number of trainees: at least 15 people. Training Location: in Viet Nam. Duration: at least 10 working days.	5	5
2.3.11.2	The quotation for training in this tender must cover two way traveling tickets, tuition fees, meals, allowances (including weekends, and commuting days), accommodation, transportation.	5	5
2.3.11.3	The bidder shall submit documents in the bid document, whose contents describe: The whole system proposed, all the necessary activities that are connected with operation, maintenance and management of the proposal system.	5	5
2.3.11.4	The bidder shall provide at least 2 online learning accounts to access online courses which provide training lesson and materials relevant to HSS or similar for 1 year.	5	0
2.3.12	OTHERS	10	10
2.3.12.1	Goods (Software and Hardware) supplied for this procurement package shall be committed to the legal rights and complied with the rules of intellectual property law and the international treaties to which Vietnamese a member	5	5
2.3.12.2	The Bidder shall ensure the intellectual property right for all offered equipment (including hardware and software). Bidder shall have following written commitments: -The bidder shall ensure that he does not have any activities that affect the safety of telecom infrastructure in supplying telecom equipment in the world and in Vietnam; -The bidder shall ensure that, in case of bid winning, telecom equipment which supplied by the bidder do not affect the safety of telecom infrastructure; -If the competent authorities detect telecom equipment supplied by the bidder affecting the safety of telecom infrastructure, the bidder shall be fully responsible and must pay compensation for any damage related.	5	5

SECTION 2. TECHNICAL REQUIREMENTS

SECTION 2A. GENERAL REQUIREMENTS

Item	Content	Max. Scores	Min. Scores	Note
A.	GENERAL REQUIREMENTS	83	67	
I	General requirements	10	10	
1	The proposed system must support all existing services in HLR/HSS system. Implementation of the project shall not affect the existing services on the network.	1	1	
2	The proposed solution shall comply to all existing services, function/features of VNPT UDC network, and also not violate to existing operation process of VNPT.	1	1	
3	The proposed solution shall make sure the system level readiness to evolve to 5GC network capability without changing in proposed system architecture.	1	1	
4	The proposed solution does not increase the risk of network errors. It's built to work seamlessly with the existing network architecture, ensuring that there are no conflicts or disruptions that might lead to network errors.	1	1	
5	The proposed system is implemented based on the latest cloud platform , ensuring ready to implement 5GC/5G SA applications in the future.	1	1	
6	The proposed solution shall be able to deploy on different hardware type (COTS HW) including: HP, Dell, etc... The vendor shall provide in detail the supported HW.	1	1	
7	The proposed HLR/HSS solution (including FEs, BEs, Provisioning gateway) must be based on virtualization (VNF) or CNF Cloud Native network function (based on Microservice architecture using container platform).	1	1	
8	The proposed HLR/HSS system must be deployed on the proposed Cloud Infrastructure	1	1	
9	PAC for HLR/HSS will be generated only when all the ATP tests have successfully done without major issues. Integration shall include data redistribution on existing nodes to new system for load balancing.	2	2	
II	General requirements for HLR HSS	73	57	
1	The Bidder shall comply with at least 3GPP R15 specification.	1	1	
2	The vendor's HLR/HSS solution shall follow and based on 3GPP technical specification User Data Convergence (UDC) defined in TS 23.335 and TS 29.335.	1	1	
3	The proposed system supports Independent scalability mechanism between FE and BE, thereby allowing independent scalability between subscriber storage module (BE) and traffic handling/service management module (FE).	1	1	
4	The proposed system has a mechanism to ensure data consistency (i.e: single point of provisioning, handling of network recovery ...)	1	1	

5	The new system must have the same function & features to the existing system, ensuring the provision of services that are using or will be used in the network. The bidder shall study all the existing features, services and comply to all of them.	1	1	1
6	The solution shall support the mechanisms for protecting the system against overload and signaling storm. The vendor shall provide the relevant function/features to support these protection mechanisms and outline in detail the related mechanisms used.	1	1	1
7	The architecture shall offer backward compatible interfaces towards the existing network elements: CS Core, PS Core, IMS core network and service network/3rd party applications (if available).	1	1	1
8	The Solution shall support the architecture which include a Subscriber Provisioning Application providing a single interface to the back end Databases for the back office Subscriber administration systems.	1	1	1
9	The solution shall support notifications of subscriber data events according to 3GPP specifications. The events may be changes on existing user data, addition of user data, and so on.	1	1	1
10	The handling of overload in a UDC system is based both on the overload protection of individual nodes, and load regulation mechanisms. Overload handling is also based on the cooperative load regulation on UDC system level (between FE & BE), should the vendor not support this functionality then vendor shall explain what mechanism it applies to handle signaling storms on UDC system, it shall also quote the needed functionality. If vendor relies solely on diameter agent or diameter routing agent to protect against signaling storms, then such a product and required functionality shall be included in the quotation.	1	1	1
11	The proposed solution shall be able to support the automation of VoLTE service data synchronization which makes it possible to synchronize a subscriber SS data between the HLR (CS system) and the HSS (IMS). Vendor shall make sure the proposed solution can interwork with existing VNPT IMS system as well as existing VoLTE SS sync solution without any additional requirement, and bear the full cost for the integration.	1	1	1
12	The VoLTE supplementary service synchronization function shall ensure the supplementary service consistency between CS and VOLTE feature synchronizes SS data that is modified by UEs, following GSMA IR.92.	1	1	1
13	The VoLTE supplementary service synchronization support the SS sync in the scenario where the user in CS network (CS subscribers) to modify their SS data in the HLR using their CS phone (3GPP TS 24.010) and when that user in VoLTE network (IMS subscribers) change their SS data in the HSS and Multimedia Telephony Application Server, using their IMS phone (3GPP TS 24.623).	1	1	1
14	The proposed solution for VoLTE supplementary service synchronization shall have 1+1 pair redundancy, each pair shall have sufficient hardware and software capacity to take over the whole traffic of the pair in case 1 node in that pair is faulty	1	1	1
15	The following supplementary service shall be support by VoLTE SS sync function: CFU, CFB, CFNRy, CFNRc, BAIC, BAOC, BOIC, BIC-roam, BOIC-exact.	1	1	1
16	The proposed SS sync solution shall be compatible and responsible to integration with existing IMS/VoLTE supplementary service synchronization in VNPT network. Vendor shall provide any additional efforts, customization required for this integration.	1	0	0
17	Front-End requirement			

17.1	The proposed solution must ensure that the expansion system shall form a single/unified HLR/HSS system with the existing system, and capable of balancing the load with the current system, ensuring the balance for both hardware and software;	1	1	1
17.2	The proposed solution shall ensure the ability and capacity to connect and integrate with the current IMS system without changing current network design, network operations and processes;	1	1	1
17.3	The proposed solution shall support the supplementary services synchronization between HLR, HSS and IMS, similar to current VNPT's supplementary service synchronization design between CS domain and IMS/VoLTE domain. The bidder shall describe the solution in detail.	1	1	1
17.4	The proposed solution shall ensure interoperability with existing UDC system elements	1	1	0
17.5	The proposed system shall integrate and use the existing authentication database (AuC) of VNPT or deploy new AuC System that are fully compatible with network	1	1	1
17.6	The new system's capacity must be able to share the load with the current system's capacity using the pooling mechanism for VNPT's current services.	1	1	1
18	BE requirements			
18.1	The proposed system must have the capability to balance the load with the current system, ensuring the balance for both hardware and software;	1	1	1
18.2	The proposed Back-end system shall comply to the geo-red architecture 1+1.	1	1	1
18.3	The proposed back-end system shall ensure user data consolidation, user data convergence for all service profiles: 2/3/4G, 5G NSA, IMS/VoLTE, Fixed IMS, VoWifi, IoT, SPR and 5G SA	1	1	1
18.4	The solution shall support a common BE Database layer for all 2G/3G/4G/5G NSA FEs, and 5G SA FEs. This common BE Database layer shall support all 2G/3G/4G/5G NSA profiles, , IoT profiles and 5G SA profiles and so ready for deploying 5G SA service	1	1	1
18.5	The BE Database layer shall have capability to upgrade to support 1+1+1 geographical redundancy, in which each FE can connect up to 3 BE nodes with the failover situation handled by FE in less than a second.	1	1	0
18.6	The proposed back-end database solution shall have the mechanism to protect the network from overload in node level	1	1	1
18.7	The proposed back-end database solution shall have the mechanism to protect the network from overload, signaling storm	1	1	1
18.8	In this case the subscriber's data not correct (dirty subs) and can not delete subscriber data through Provisioning system, the proposed back-end database solution shall have tool to delete this subs and this action are not impact to the database. The solution shall be well described and offered.	2	0	0
18.9	The proposed back-end database solution shall have the mechanism to protect data from ransomware. The solution shall be well described and offered.	5	0	0
19	Provisioning subsystem			
19.1	The proposed provisioning subsystem shall supply the additional capacity requirement for this scope.	1	1	1

19.2	The proposed provisioning subsystem shall have the ability to work with the existing provisioning system to ensure providing all existing provisioning services without interruption.	1	1	1
19.3	The proposed system is capable of provisioning/declaring for all existing subscriber sets on VNPT network. I.e: 2/3/4G, 5G SA/NSA, IMS fix/VoLTE, SPR as well as support the transition to meet the 5G SA subscription provisioning.	1	1	1
19.4	The proposed system shall have be integrated with VNPT's existing provisioning system (SPS) without any changes in existing tasks, services, and configurations on SPS in the creation/change/deletion of subscriber data.	1	1	1
19.5	The proposed system shall provide single point of provisioning gateway to support all existing provisioning services.	1	1	1
19.6	The proposed system shall have the capability of auto provisioning for VoLTE subscribers and upgrading to support 5GC/5G SA auto provisioning.	1	0	0
19.7	The proposed system shall have the mechanism to retry the previous failure commands in a timer that can config	2	0	0
19.8	The proposed system shall have the capability of store provisioning log at least 45 days and provide method to export provisioning log based on certain conditions (for example: error codes, MSISDN range, IMSI range)	3	0	0
19.9	The proposed system shall support the IMSI & MSISDN change-over feature.	1	1	1
19.10	The proposed system shall support for existing MML/CAI3G interfaces to SPS, as well as the possibility to upgrade to REST interface support for 5G SA in the future.	1	1	1
19.11	The system supports the ability to prevent split subscriber's profile/subscriber's profile inconsistency.	1	0	0
19.12	The provisioning system shall have capability to support geographical redundancy deployment.	1	1	1
19.13	The provisioning support system shall be independently scalable.	1	1	1
19.14	The proposed system shall be able to support the existing provisioning solution for Multi-SIM service, including the SES (entitlement server) provisioning flow.	1	1	1
19.15	The proposed system shall be able to provision all the HLR/HSS's BE system after project	1	1	1
19.16	The proposed provisioning solution shall provide to the following functions to comply to the requirement of VNPT to support the solution when there's multi-vendor UDC systems:			INF
	-Provide the single interface towards existing VNPT's SPS and single provisioning gateway of UDC in VNPT network.	1	1	1
	-Support SOAP/CAI3G, MML interfaces	1	1	1
	-Have mediation function to identify a single subscriber's identity (IMSI/MSISDN) from provisioning request of SPS, and process the provisioning request of that specific subscriber, to route the provisioning request to the correct UDC system where VNPT has designed to support that specific subscriber (new UDC system in this scope or existing UDC system in VNPT network).	1	1	1
	-Have the embedded database to record and store the location of UDC subscribers in both current UDC system and new UDC system based on subscriber's identity (MSISDN, IMSI), in order to re-direct the provisioning flows into the correct UDM system where subscriber is supported, when there's provisioning requests from SPS.	1	1	1

	-Support SSH, FTP/sFTP, HTTP/HTTps interfaces for access control and file transfer	1	1	1
	-Have capability to store the system logs, provisioning logs, transaction logs, etc ... for at least 3 months to support operation	1	0	0
	The provisioning solution shall support all existing provisioning flows and request from SPS for IMS subscribers. Including (but not limited to):			
	- "Query/get, create, modify, delete" requests for a single subscriber's data	1	1	1
	- Support to process provisioning requests for all CS & PS subscriber's related profiles in existing VNPT networks: 2/3/4G profile,	1	1	1
19.17	- Support to process provisioning requests for all IMS subscriber's related profiles in existing VNPT networks: ICS profile, HSS-EPC & HSS-IMS profile, MMTel AS, SCC-AS profile, ENUM profile, fixed IMS ...	1	1	1
	- Support to process provisioning requests for IoT profile	1	1	1
	- Support batch provisioning capability to support large number of provisioning requests	1	0	0
	- Have capability to support at least 500 concurrent sessions from SPS, at the same time.	1	1	1
20	OAM system (OSS, CNF-M)			
20.1	The proposed OAM system shall provide functions of: FM (Fault management), PM (Performance management) and CM (Configuration management). The OAM system capacity complies to the scope of supply.	1	1	1
20.2	The OAM system provides CNF-M function according to ETSI MANO. Ensure the ability to manage instantiate/scaling for CNFs as well as LCM (life cycle mgmt, i.e upgrade/update) of CNF elements of the project.	1	0	0
21	Migration/Integration			
21.1	The integration process shall make sure that all services, features, functions provided in this project are tested and work successfully.	1	1	1
21.2	The system supports the ability to migrate subscriber database from current system to the proposed HLR/HSS system. The feature allows to migrate/move the subscriber data without affecting the important service (traffic) of the subscriber.	1	1	1
21.3	The migration function shall support to migrate individual subscribers, lists of subscribers, ranges of subscribers, and based on subscriber's identities (MSISDN/IMSI).	1	1	1
21.4	The subscriber database migration procedure shall ensure the consistency of the subscriber database and does not cause data inconsistency.	1	1	1
21.5	VNPT can actively use this database migration feature in certain operations.	1	0	0

SECTION 2. TECHNICAL REQUIREMENTS
SECTION 2B. HLR/HSS REQUIREMENTS

Item	Content	Max. Scores	Min. Scores	Note
B	HLR/HSS REQUIREMENTS	262	215	
1	PLATFORM REQUIREMENTS	34	31	
1.1	System Architecture	6	4	
1.1.1	The logical architecture of the proposed solution should support layered architecture, like signal access layer, service logic layer, data routing/partitioning layer, data storage layer.	1	1	
1.1.2	The logical architecture shall be a complete separation between the applications and the database.	1	1	
1.1.3	The system must be compliant with full distributed-architecture, which means all nodes of FE and BE can be deployed in different geographic location, as well as the ability to adding or expanding FE and BE after the first installation to have more capacity. This can provide flexible network deployment/topology according to operator's requirements.	1	1	
1.1.4	Application layer should work in load sharing mode at node level.	1	0	
1.1.5	Inside a node VNF/CNF, the all processing components (i.e Pods, VMs) should support N+k redundancy.	1	1	
1.1.6	The Application Layer should support on-line introduce new application without service interruption.	1	0	
1.2	REDUNDANCY AND RELIABILITY	9	9	
1.2.1	In detail, the bidder shall state and describe the redundancy mechanism each of equipment provided.	1	1	
1.2.2	In detail, the bidder shall state that all critical components of the equipment shall support redundancy mechanism: Processors, memory, control and data buses, and other critical components like Database Server Component, Signaling Component, Networking and Infrastructure Component...	1	1	
1.2.3	The HLR/HSS shall be designed in such a way that single faults in the software shall not cause a system failure or service interruption or degradation of system performance. Under faulty conditions, the system shall continue to operate normally without reduced grade of service or quality of service.	1	1	
1.2.4	The HLR/HSS shall be designed in such way that the data can be duplicated on geographically separated locations in real time.	1	1	
1.2.5	The vendor is requested to explain in detail how these reliable mechanisms are implemented in proposed HLR/HSS.	1	1	
1.2.6	The data reliability of the HLR/HSS shall be ensured by subscriber data backup to disks (storage solution), these backups can be transferred to external servers.	1	1	

1.2.7	The proposed HLR/HSS shall support 1+1 Load-sharing geographic Redundancy. The data synchronization between different Back End should be real time (either synchronous or asynchronous mechanism).	1	1
1.2.8	For redundancy solution, the HLR/HSS should support switch over, and can be configured by operator.	1	1
1.2.9	Vendor must provide and explain the signaling overload protection mechanism of offered HLR/HSS system.	1	1
1.3	STANDARD REQUIREMENTS	2	2
1.3.1	All components, elements, interfaces, protocols, functions and facilities of the system must be implemented as defined in the relevant GSM/3GPP recommendations.	1	1
1.3.2	The HLR/HSS architecture must be compatible with 3GPP TS 23.002, 3GPP TS23.335.	1	1
1.4	SOFTWARE, HARDWARE DESIGN AND UPGRADE	6	6
1.4.1	The system shall be offered with the latest software release.	1	1
1.4.2	Vendor shall provide information on functionality and standardized procedures for performing software installation, download, upgrade and backup. The software handling shall be able to be processed both locally and remotely via vendor's proposed O&M system. Mechanisms for minimal disturbance of the network/node shall be clearly described. Standardized procedures for the software handling shall be clearly described and offered the Operator.	1	1
1.4.3	The HLR/HSS system shall be modular in design. The HLR/HSS system shall be upgradeable to a higher software release without impact to the existing traffic & services	1	1
1.4.4	All equipment proposed in this tender must be for indoor installation.	1	1
1.4.5	The upgrade of the HLR/HSS network elements shall be described. The mechanisms to maintain the integrity of the mobility data have to be considered in the Vendor's answer	1	1
1.4.6	Vendor shall provide the clear roadmap and evolution of supply system to support and evolve to Telco Cloud & 5GC.	1	1
1.5	EXPANSIBILITY REQUIREMENTS	2	1
1.5.1	The bidder shall describe the ability to expand the system up to 100M of activated subscriber without any impact on normal operation.	1	0
1.5.2	The system offered shall be upgraded to support 5G SA/NSA	1	0
1.6	NETWORK INTEGRATION	2	2
1.6.1	The proposing system must be able to be integrated with GSM/UMTS/LTE and IMS network according to 3GPP guidelines, and an integrated example should be proposed.	1	1
1.6.2	In order to support the network integration, the existing MSS/SGSN/STP/PGW/DRA... nodes shall be able to be connected to the new HLR/HSS by SIGTRAN and Diameter/IP.	1	1

1.7	NETWORK LEVEL REQUIREMENTS	5	5
1.7.1	The proposed solution and the included nodes should support full implementation of SS7/Diameter signaling over IP in the network.	1	1
1.7.2	The proposed system should support a common core network for 2G, 3G, 4G and IMS.	1	1
1.7.3	IPv4 and IPv6 should be supported in any IP-based equipment. The network shall support IPv6 as well as inter-working to IPv4/IPv6 devices and interconnection to IPv4/IPv6 core networks.	1	1
1.7.4	The proposed system should be designed according to 3GPP standard and will be able to interwork with any vendor equipment comply with 3GPP standard, as below:		
	Cx interface between HSS and CSCF.	2	2
	Dx interfaces between HSS and CSCF, AS.		
	Sh interfaces between HSS and AS/IM-SSF.		
	S6a interface between HSS and MME.		
1.8	PERFORMANCE	2	2
1.8.1	Vendor shall detail all failure modes which will have an impact on the nominal node performance.	1	1
1.8.2	Vendor should give guidelines for creating connections to their system to achieve the best performance.	1	1
2	REQUIREMENTS FOR AUC	22	18
2.1	The authentication center (AuC) must store the keys required for checking whether a mobile subscriber is authorized to access the PLMN. The checking is performed by means of triples. They are generated for each individual mobile subscriber and stored in the AuC database. A triple contains two authentication parameter and a cipher-key which is used to encipher and decipher the user information on the radio path. Triples are generated by means of cryptographic algorithms.	1	1
2.2	The AuC must consist of the AuC software and the security boxes, which are physically and logically protected units.	1	1
2.3	The AuC software shall contain the AuC subscriber database, the triple database and the key database.	1	1
2.4	The security boxes shall store all security algorithms and associated keys needed for security functions.	1	1
2.5	The IMSI and Ki data shall be stored in AuC. Ki must exchange and store in encryption.	1	1
2.6	In order to securely back up the AuC subscriber database (HLR identifications and AuC subscriber data) to a regeneration file on tape, the security box must have capability to generate a new session key K4. This one is used for the following purpose: the authentication key Ki for each subscriber has to be written in a file as a code encrypted in the form A4 (Ki). This file also contains the new K4 in an encrypted form and the complete file is signed.	1	1
2.7	The security box of the AuC node receives the subscriber record data, together with a new key reference K4 that is assigned upon the creation of the regeneration file:	2	2

	Algorithm A3 must comply with 3GPP TS 43.020 clause C.2.				
	Algorithm A8 must comply with 3GPP TS 43.020 clause C.3.				
2.8	The identity vector number requests from VLR must comply with 3GPP TS 29.002.	1	1	1	
2.9	The AuC processes must provide administration functions which mainly apply to the AuC database:				
	Administration of AuC subscriber data.				
	Secure regeneration of AuC subscriber database.	4		4	
	Re-encryption of AuC subscriber database.				
	Secured logging for AuC subscriber data.				
2.1	Key management functions allow the AuC to handle security data. This data is used for highly secure transport of secret information between the AuC and Network Management, or OMC elements.	1		1	
2.11	Maintenance functions which mainly apply to the security boxes shall be supported				
	error handling:				
	Error verification	4		2	
	Periodic monitoring				
	Test/diagnosis				
	Error treatment				
2.12	These AuC system recovery mechanism shall be supported:				
	Triple delivery during AuC recovery				
	Data restoration after AuC recovery	4		2	
	Restart of AuC tasks				
3	REQUIREMENTS FOR HSS	82		71	
3.1	Requirements for IMS services	57		50	
3.1.1	The proposed HSS shall provide a variety of functionalities and procedures related to subscription management, mobility management procedures, session establishment control, user authentication, and access authorization in the IMS network.	1		1	
3.1.2	The HSS Application shall support the logical functions as displayed according to 3GPP TS 23.002.	1		1	
3.1.3	The HSS Application shall provide the logical functions across all IP network access types, including wireless, fixed, and broadband.	1		1	
3.1.4	The bidder shall provide in details any proprietary implementation in HSS functionality and a clear evolution path towards the standard one as described in the 3GPP specifications.	1		1	
3.1.5	The bidder shall provide the nominal capacity and performance figures for all available HSS configuration and explain how these are affected by the processor load.	1		1	

3.1.6	The HSS Application shall support the following features:			
	User Authentication Support			
	SSO support			
	Service Profile Handling			
	Network Domain Selection			
	HLR Interworking (via MAP)			
	Support of Multiple Public/Private User IDs	8	4	
	User Mobility Support			
	SMS-C Interworking (via MAP)			
	Application Data Repository (BLOB)			
	Radius Interworking with AAA Server (mobile and fixed)			
	Support of Subscriber Self Care			
3.1.7	The HSS Application shall provide user authorization for call/session establishment and service invocation.	1	1	
3.1.8	The HSS Application shall keep track of currently assigned S-CSCF.	1	1	
3.1.9	The HSS Application shall authorize the user for mobile access when requested by the MSC/VLR, SGSN, AAA Server or CSCF, by checking that the user is allowed to roam to that visited network.	1	1	
3.1.10	The HSS Application shall support multiple subscriber types including VoLTE, VoIP, Wi-Fi.	1	1	
3.1.11	The HSS Application shall support distinction between online and offline (prepaid and post-paid) subscribers by the appropriate parameters sets and delivery to an IMS application in SIP signaling.	1	1	
3.1.12	The HSS Application shall be able to deliver subscriber information to an IMS application either on demand or as the subscriber information changes.	1	1	
3.1.13	The HSS Application shall provide a highly scalable solution that is easily expanded as more services are migrated to the IMS portfolio. The bidder shall elaborate by disclosing the appropriate figures how the HSS can scale up based on the number of subscribers and the extent of the services which need to be supported.	1	1	
3.1.14	The HSS Application shall support Diameter protocol (RFC3588/6733) to communicate with IMS Application servers.	1	1	
3.1.15	The bidder shall state the extent to which its HSS supports other protocols (LDAP, etc.) to interface with IMS application servers	1	1	
3.1.16	The bidder shall state the extent to which its HSS supports Sh (between HSS and AS) interface.	1	1	
3.1.17	The HSS Application shall store service trigger information (Initial Filter Criteria or iFC), application server identities and service keys related to IMS services.	1	1	
3.1.18	The bidder shall indicate how many Initial Filter Criteria (iFC) can be allocated per IMS user.	1	1	

3.1.19	The HSS Application shall contain the IP Multimedia Public Identities (IMPU), IP Multimedia Private Identity (IMPI), International Mobile Subscriber Identity (IMSI), International Mobile Equipment Identity (IMEI) and Mobile Subscriber International Subscriber Directory Number (MSISDN) information of user subscribers.	1	1	
3.1.20	The HSS Application shall support multiple IMPUs per IMPI and more than one IMPI per IMS user.	1		1
3.1.21	The HSS Application shall allow simultaneous IMPU registration from different access types.	1		1
3.1.22	The HSS Application shall support the IMPU based on SIP URI and E.164/TEL URI as defined in 3GPP standards. Any deviation shall be explicitly stated.	1		1
3.1.23	The IMPI shall take the format of a Network Access Identifier (NAI). The format of a NAI is e.g. <u>username@operator.com</u> .	1		1
3.1.24	The HSS shall support information transfer over the Cx interface for the following procedures:			
	CSCF assignment			
	Routing information retrieval from HSS to CSCF			
	Authorization	4		4
	Authentication			
3.1.25	Filter control (transfer of iFC from HSS to CSCF)			
	The HSS Application shall support standard Cx and Dx Diameter interfaces as specified by the 3GPP specifications. Any proprietary implementation shall be described in detail.	1		1
	The bidder shall provide a detailed roadmap in terms of HSS functions as specified in the 3GPP standards.	1		1
	The HSS shall support the Cx and Sh interface 3GPP TS 29.228, TS 29.229, 3GPP TS 29.328, 3GPP TS 29.329. The SCTP transport protocol must be supported for Cx and Sh interface.	1		1
	The HSS shall have the capability to perform administrative de-registration as described by 3GPP TS 29.228.	1		1
3.1.29	The HSS shall support the following data through Sh interface: Repository Data, IMS Public Identity IMS User State, S-CSCF Name, Initial Filter Criteria, Location Information, User State, Charging information, MSISDN, PSI Activation and Aliases Repository Data.	1		1
3.1.30	The HSS shall allow the application server to update the transparent data stored in the HSS for a Public User Identity or Public Service Identity.	1		1
3.1.31	The HSS shall support Subscription/Notifications procedure on Sh interface defined in the 3GPP TS 29.328 for specific transparent and/or non-transparent data for a given Public User Identity or Public Service Identity.	1		1
3.1.32	The HSS shall support template provisioning functionality to reduce the complex of provisioning.	1		1
3.1.33	The HSS shall support database backup automatically.	1		1
3.1.34	The HSS shall support managing transparent data via provisioning interface.	1		1

3.1.35	The HSS shall allow the application server to update the public service identity activation state in the HSS.	1	1	1
3.1.36	The HSS shall support NASS location information management via Sh interface.	1	1	1
3.1.37	The HSS shall support MAP interface towards HLR.	1	0	
3.1.38	HSS and SLF must be able to deploy separately or in one single physical node.	1	1	
3.1.39	The HSS shall support following authentication mechanisms :			
	IMS AKA	4	2	
	Early IMS			
	NASS bundle			
3.1.40	The HSS shall support the early IMS security (GIBA/SSO) mechanism described in 3GPP TS 33.978.	1	1	
3.1.41	The HSS shall support following data model:			
	Each Public User Identity HTTP Digest			
	Each Private User Identity of an IMS user shall be capable of being assigned to more than one Private User Identity of the same IMS user.	4	4	
	Each Private User Identity of an IMS user shall be capable of being assigned to more than one Public User Identity of the same IMS user.			
	Each Service Profile of an IMS user shall be capable of being assigned to more than one Public User Identity of the same IMS user.			
	Each Public User Identity of an IMS user shall be assigned exactly to one Service Profile.	25	21	
3.2	LTE HSS			
3.2.1	The LTE HSS provides the handling of subscriptions, authentication, authorization, user traffic protection, and mobility management in the EPC domain.	1	1	
3.2.2	The LTE HSS Application shall support the following basic services:			
	Manage the mobility of subscribers by means of updating their position in administrative areas handled by MMEs. The action of a user of moving from one MME to another is followed by the HSS with a location update procedure.			
	Send the subscriber data profile to a MME when a subscriber first roams there.			
	Remove subscriber data from the previous MME when a subscriber has roamed away from it.	5	5	
	Calculate Authentication Vectors based on the SIM credentials and sent them to MME for validation against the ones received from the phone.			
	The LTE HSS is connected to an MME using the Diameter Protocol defined by the IETF, The Diameter interface used between the LTE HSS and the MME is named S6a, the Diameter interface used between the LTE HSS and the S4-SGSN is named S6d.			
3.2.3	The HSS shall supply ATR (Access Type Restriction) feature.	1	1	

3.2.4	The HSS shall support roaming architecture that compliant to 3GPP TS 23.401 protocol (e.g. Include both home routed and local breakout).	1	1	1
3.2.5	Vendor shall supply wildcard APN feature.	1	1	1
3.2.6	The HSS shall support the store of EPC Subscriber Data defined in 3GPP TS23.008 Clause 5.2A.	1	1	1
3.2.7	The HSS shall support S6a interface based on Diameter protocol (Over SCTP).	1	1	1
3.2.8	Please describe functionalities of HSS support for subscriber data and QoS parameters.	1	1	1
3.2.9	The HSS shall support EPC Subscription Management: Each EPC User is associated with a configured EPC subscription profile containing the information that defines the service that must be provided to that user. It is possible to define profile information individually for each EPC User. Each EPC User can be assigned Access Restriction Data as well as a static IP address.	1	1	1
3.2.10	The HSS shall support EPC APN Configuration: APN configuration allows the definition of APNs to be referenced from as many EPC subscription profiles as needed. The information in the APN configuration includes the following (see 3GPP TS 23.401, 32.251 for further info on these information items):	4	2	
	APN identifier			
	Quality of service profile			
	Context identifier			
	VPLMN address allowed indicator			
3.2.11	Bearer Charging Characteristics	1	1	
	PDN Type (IPv4 or IPv6)			
	The definition of both wildcarded and non-wildcarded APNs is supported. A static PDN GW identity can be configured per APN.			
3.2.12	The HSS shall support EPC Authentication Support: The Vendor shall state that the HSS will support mechanisms for user authentication (describe all available options and supported protocols and mechanisms).	1	1	1
3.2.13	EPC authentication support feature manages the authentication procedures defined in 3GPP specifications for the EPC domain, based on USIM Authentication and Key Agreement (AKA).	1	1	1
3.2.14	The HSS shall support Roaming Restriction based on VPLMN Identity: Whenever an end-user is roaming, the corresponding VPLMN identity can be checked against a pre-configured white list of VPLMN identities, thus enforcing control of whether roaming to that specific VPLMN is allowed.	1	1	1
3.2.15	The HSS shall support EPC Operator Determined Barring: This feature provides the operator with means for restricting user activities in the EPC domain. The feature is a powerful tool to prevent and control fraud. Users can be barred for the following:	4	2	
	All Packet Oriented Services			
	Roamer Access to access points in the Home PLMN			
	Roamer Access to access points in the Visited PLMNs			

4	REQUIREMENTS FOR BE – CENTRALIZED USER DATABASE	57	44
4.1	GENERAL REQUIREMENTS	20	15
4.1.1	Back end of HLR/HSS shall be the centralized user database that will allow VNPT to converge all databases used by different services and applications.	1	1
4.1.2	The database must have the ability to store following subscriber data: HLR/AUC, IMS HSS, LTE HSS, EIR, SPR, MNP, IoT/M2M ... The database must have open interface to allow VNPT to integrate with other vendor's front end and the vendor shall provide reference to prove that integration on live networks.	1	1
4.1.3	The database shall be accessed by the FEs through Ud interface -User Data interface as defined in 3GPP.	1	1
4.1.4	The system must work in 1+1 load sharing redundancy mode.	1	1
4.1.5	All function units in same cluster must work in load sharing mode.	2	2
4.1.6	The system should provide a tool to achieve the migration of the current databases.	1	0
4.1.7	Vendor shall detail data consistent mechanism between different data storage unit.	1	1
4.1.8	The BE database system must comply with Telco grade requirements:		
	Availability: 99.999%		
	Latency: less than 150ms	4	2
	Concurrent sessions: more than 1000 sessions		
4.1.9	Throughput: more than 1000 session per second		
	Vendor shall describe whether the subscriber database Layer can support on-line expansion without service interruption and detail mechanism.	2	0
4.1.10	The BE database system must be able to support up to 150 Million subscriber profiles within only one.	2	0
4.1.11	Subscriber data schema in BE must be Consolidated Data Model, which can support Single subscriber Identifier to connect to difference application (2G/3G, LTE, NR etc.)	2	0
4.1.12	The BE Database layer must support 1+1 and could upgrade to support 1+1+1 geographical redundancy, in which each FE can connect up to 3 BE nodes (Active/Standby or Active/Standby/Standby) with the failover situation handled by FE in less than a second.	2	1
4.2	REQUIREMENTS OF THE DATABASE	26	19
4.2.1	The information organization of the data repository should support DIT (Directory Information Tree) structure. Vendor needs to clearly describe how to enable consolidation of all subscribers in a single repository by using DIT.	1	0
4.2.2	The database shall support near real-time synchronization and replication of data and shall store each data element in at least 2 sites.	1	1
4.2.3	The database shall be based on an in-memory database.	1	0
4.2.4	The database shall support database events (triggers) and notifications.	1	0

4.2.5	The database shall support data consolidation, data federation and data partitioning.	1	0	
4.2.6	The schema of the databases in the system should be flexible for extending with new fields etc. It should be possible easily from the provisioning system to update the additional new fields.	1	0	
4.2.7	In the event of any modification in the databases from the provisioning system, say for example customer status update from prepaid to prepaid or prepaid to hybrid or even deletion of customer, there needs to be system initiated notifications to VAS nodes.	1	0	
4.2.8	The system should support to access the data stored in the repository without any changes to existing applications.	2	0	
4.2.9	The system must adopt cluster management mechanism.	1	1	
4.2.10	Vendor shall describe in general terms the mechanisms in the subscriber database layer to protect the system in overload situation.	2	0	
4.2.11	All subscriber data must store in memory, hard disk and/or disk array just use for back up.	1	1	
4.2.12	The subscriber database layer must support multiple level data backup.	1	1	
4.2.13	Vendor shall detail data synchronization mechanism between different data storage.	2	0	
4.2.14	The system shall have authentication mechanism for client accessing the database.	1	1	
4.2.15	The subscriber database shall update all instances of the same data in a synchronous or asynchronous manner such that the Front End Applications have a consistent view of the data.	2	0	
4.2.16	Vendor shall describe backup and restore (B&R) mechanism present in the database.	2	0	
4.2.17	All Subscriber data shall have auto backup mechanism to external SFTP Server without impacting traffic, the export files are readable without decoding	5	0	
4.3	NETWORK INTERFACE AND PROTOCOL	11	7	
4.3.1	The database shall support LDAP protocol and LDAP security standards defined in the LDAP v3 RFCs.	1	0	
4.3.2	The database shall support secure connection for external applications FEs.	1	0	
4.3.3	The database shall support secure communications protocols for all Network Element Access.	1	0	
4.3.4	The Database must be flexible to adapt to the rapidly growth of subscriber dynamic changing data/value (attribute growth).	1	0	
4.3.5	The Database must be flexible to support future network element interfaces and standard protocols for retrieving data or adaptable to data virtualization/containerization.	1	0	
4.3.6	Explain the network element interfaces and the standard protocols and how these elements interface with the Database system.	1	0	
4.3.7	Vendor shall describe protocols between database and other components with diagram. Describe the communications protocols used to access network elements for each component.	1	0	

4.3.8	The Database system must be robust to handle data entries changes, in real-time and meet high performance (read/write) expectation.	1	0	
4.3.9	The Database system must be robust to handle database configuration changes in real-time and meet high performance (read/write) expectation.	1	0	
4.3.10	The system must support dynamic transactions (read only, write only, mixed operations, etc.) from the Applications/Clients and meet the traffic volume expectation.	1	1	
4.3.11	The Database solution must be able to recover if there is an unexpected system shutdown. All security files, tables, database and applications MUST be able to survive system restart or power failure.	1	1	
5	CENTRALIZED SERVICE PROVISIONING SYSTEM	17	12	
5.1	GENERAL REQUIREMENTS	7	4	
5.1.1	The vendor shall provide a centralized service provisioning system which complying with 3GPP standards to create, modify, search and query records in the database.	1	1	
5.1.2	The provisioning system shall supports more than one provisioning server and more than one interface server for every provisioning server to realize parallel process.	2	1	
5.1.3	Tools shall be available for analysis, extraction, manipulation and changing of subscriber data.	2	1	
5.1.4	The provisioning system shall have load balancing mechanism for provisioning system.	2	1	
5.2	INTERFACES REQUIREMENT	10	7	
5.2.1	The solution offers a wide range of interfaces:			
	CORBA CM for all with unitary commands: Compliant to 3GPP TS 32.603 specifications.			
	Bulk XML for mass management operations: Compliant to 3GPP TS 32.615 specifications.	4	2	
	SOAP CM: Compliant to 3GPP TS 32.607 specifications.			
	MML, SPML, HTTP & HTTPS, LDAP & LDAPS			
5.2.2	The provisioning interface should meet the following requirements:			
	A single point of access, to do provisioning for the whole system.			
	Support at least 500 simultaneous sessions.			
	Having redundancy to ensure the absence of single points of failure.	4	4	
	Support mass updates (e.g. changing certain parameters for a group of subscribers matching certain criteria).			
	Support profile based subscriber management (e.g. updating parameter of a profile would give effect to all subscribers having that profile).			
5.2.3	The system must support interface toward 3rd party applications following 3GPP, detailed document for operation and for integration with 3rd party applications.	2	0	

6	OPERATION AND MAINTENANCE	50	39
6.1	GENERAL REQUIREMENTS	13	9
6.1.1	The vendor shall provide Operation and Maintenance system for HLR/HSS with man-machine interface to offer fault management, configuration management, alarm management, performance measurement and security management.	1	1
6.1.2	The O&M system can not only be controlled through the local console, but also be managed by EMS in a centralized way by accessing the local maintenance center of EMS.	1	1
6.1.3	The O&M system cannot be single point of failure in one site, O&M system have its backup in local site.	1	1
	The O&M system should provide the tracing tool based on subscriber (MSISDN, IMSI ...)	2	0
6.1.4	The O&M system must have interface for operation and maintenance: GUI Web interface	4	2
6.1.5	The HLR/HSS O&M system must provide tools and procedures to access and control through GUI/CLI to manage following issues: Self-detect errors and process for full system. Store all history interfaces. Automatic re-run procedures. Volume (traffic) measurement. Storage and use. Bidder must provide user interface sample in pictures.	4	2
6.2	CONFIGURATION MANAGEMENT	8	4
6.2.1	The proposed HLR/HSS shall support the following data configuration management features: Strict user authority defining the operation scope of each level. Reasonable task assignment for the purpose of flexible operations. Local maintenance or remote centralized maintenance. Online data modification and creation/loading without affecting services.	4	2
6.2.2	The proposed HLR/HSS shall support the following subscriber data management: Convenient service addition, modification, and deletion functions. Operation log function that provides detailed operation history. Interfaces to business halls. Requirements as stated in the provisioning system requirements.	4	2

6.3	PERFORMANCE MANAGEMENT	10	7
6.3.1	The proposed HLR/HSS shall support customized measurement report and customized measurement entity.	1	1
6.3.2	The proposed HLR/HSS shall support three measurement time- segments a day with measurement day designated by month or by week or daily	2	1
6.3.3	The proposed HLR/HSS shall support concise report that supports customized grouping of measurement entities.	2	1
6.3.4	The HLR/HSS performance management shall support the function of selecting any desired measurement entities in the same measurement type to output reports. If the measurement objects are the same, it can select the measurement entities in the same function type of different measurement types to output reports.	1	0
6.3.5	Customers can define measurement entities through arithmetic expressions based on existing indexes. The operand of the arithmetic expression can be a constant, measurement cycle, or a measurement entity of the HLR/HSS.	1	0
6.3.6	The calls and traffic can be scanned and measured on a real-time basis.	1	0
6.3.7	The HLR/HSS performance management shall support standard and open output format, with printing function available	1	0
6.3.8	Dedicated performance measurement analysis tools such as for analyzing call completion rate, congestion, call drops, handoffs, and traffic density.	1	0
6.4	ALARMS MANAGEMENT AND MAINTENANCE	8	5
6.4.1	The proposed HLR/HSS shall support the following alarm management:		
	Collect alarm information upon alarm occurrence or alarm clearance.		
	Classify alarm information and send them to the Alarm management function according to their priority levels.	2	1
	Display detailed descriptions and removal suggestions of alarms on graphical interfaces through the Alarm management function alarm console.		
6.4.2	The proposed HLR/HSS shall support the following NE maintenance functions:		
	Monitoring the status of a link, a timeslot or a board of a functional unit.	2	1
	Remote maintenance to the equipment.		
6.4.3	The proposed HLR/HSS shall support complete user operation logs and equipment running logs:		
	Friendly and easy-to-use output interfaces for logs, with detailed online help.		
	Viewable log information.		
	Explanation and analysis for non-viewable information.	2	1
	Filtering of test and debug information in the logs to help maintenance engineers locate faults based on the log information.		
6.4.4	The proposed HLR/HSS shall support the following secure and convenient remote maintenance functions. The software offers effective protections against viruses, hackers, and malicious attacks:	2	1
	Query the versions and status of subsystems and each module.		

	Monitor and isolate system faults.				
	Query alarm information of the HLR/HSS.				
	Test and debug the functional interfaces of the HLR/HSS.				
	Obtain real-time operation information of the HLR/HSS.				
6.5	SYSTEM BACKUP AND RESTORE	5	2.5		
	The bidder provides mechanism, software for backup and restores system:				
	Backup/restore procedure with original structured data and user data directory. Bidder must describe detail about this.				
	Bidder must describe all automatic procedures for enhancing system availability.				
	Backup process ensures not stop service operation.				
	Backup including system operation, application, configuration data, customer data and other necessary information to ensure that system can be restored with full function and working properly.	5	2.5		
	System must restore fully from backup.				
6.6	SECURITY MANAGEMENT	6	4		
	The HLR/HSS system supports multiple users. For the purpose of security and convenience, the system shall support authority management and log management.				
	Authority Management.				
6.6.1	The authority of operators and workstations is under the hierarchical management. In the O&M system of HLR/HSS, the execution of a MML/LDAP command is subject to two conditions: the authority of the operator. The command cannot be executed if any of these conditions is not satisfied.	4	2		
	Log management.				
6.6.2	It enables the querying of MML/LDAP operation records. By querying the operation log, you can specify any operation has been conducted to endanger the normal operation of the system.	2	2		

SECTION 2. TECHNICAL REQUIREMENTS

SECTION 2C. INFRASTRUCTURE REQUIREMENTS

Item	Content	Max. Scores	Min. Scores	Note
C	INFRASTRUCTURE REQUIREMENTS	216	171	
I	GENERAL REQUIREMENTS	14	10	
1	Redundancy and Reliability	6	4	
1.1	The proposed system shall meet the 99.999% availability requirement	2	2	
1.2	The proposed system shall support resilience mechanism and imply the following key areas:	4	2	
	- Interface Redundancy;			
	- Internal Redundancy (intra-node);			
	- Recovery Mechanisms;			
	- Backup and Restore;			
2	- Network Redundancy (inter-node).	1	1	
	Configuration and Scalability			
	The proposed system shall not limit the maximum configuration for each 1 VIM/CaaS, 1 NFVI/Cloud Native Infrastructure, 1 server/compute and the maximum capacity for 1 VNF/CNF	1	1	
3	Platform requirements	3	2	
3.1	All Hardware must be new and of the latest version and has at least 5 years before it's end of support, counting from the signed contract date. During the 5 (or more) years, the hardware must be ready for latest software version. If the hardware failed to be ready for the latest software version, the Bidder shall be responsible for providing the new hardware at no cost.	1	1	
3.2	The proposed system shall support redundancy for all components (card, switch fabric, interface, power, hard disk, link, port etc.):	1	1	
	- For management cards/servers: 1+1 redundancy is required			
	- for Fan tray: 1+1 is required.			
3.3	The proposed solution shall provide a single cloud-infrastructure platform that can host both an OpenStack-based virtualized infrastructure for VNFs and a bare-metal Kubernetes platform for CNFs on the same hardware, with clear separation of execution environments and shared use of the common data-center fabric and operations tooling.	1	0	
4	Power Supply	1	1	
	The proposed main system will be using VNPT Net 48V DC power supply system.	1	1	

	The proposed system shall support:				
	- 1+1 Power Supply Protection, Hot-Swappable Power Supplies;				
	- Support DC power supply (Rated voltage Range: -40 ÷ -60 VDC);				
	- Using fans For heat dissipation to cool the system;				
	- Temperature sensors are available and fan speed control is done dependent on the Temperature on the environment around the rack.				
	The Bidder shall state the average and maximum power consumption of each proposed products.				
5	Environmental impact	3	2		
5.1	The Bidder shall list the standards supported for the environmental conditions and the compliancy for the earthquake resistance international standard and the RoHS compliancy.	1	0		
	The proposed system shall comply to the following environmental conditions:				
5.2	- Normal Conditions with ambient temperature of +5 °C ~+40 °C at a relative.	2	1		
	- Abnormal Conditions for periods of up to 24 hours with ambient temperature of + 45 °C at a relative humidity of 85%;				
II	HARDWARE REQUIREMENTS	71	55		
1	Compute Domain	24	18		
1.1	The compute hardware must support common chassis/rack for storage, compute and networking components	1	1		
1.2	The compute hardware must support dual power feed	1	1		
1.3	The compute hardware must be based on COTS Intel x86 and have below feature enabled: Intel Virtualization Technology (Intel VT) enabled; Advanced Vector Extensions (AVX); Advanced Encrypted Standard (AES);	1	1		
1.4	The compute hardware must support multi-socket, multi-core and support for Hyperthreading technology except XEON6 chip compute	1	1		
1.5	All the technologies developed by Intel for cloud/virtualization technology must be supported	1	1		
1.6	The compute hardware must support Non-uniform Memory Access (NUMA) topology exposure allows VMs/CaaS to have optimal resource access.	1	1		
1.7	The compute hardware must utilize Intel x86 Xeon processors, specifically 4th Gen Intel Xeon Scalable (Sapphire Rapids) N-series or the latest Intel Xeon 6 (Sierra Forest), designed for Telco-grade applications. The system must support a minimum of 128 logical or physical cores per compute node, which can be achieved through either a dual-socket configuration or a high-density single-socket configuration to optimize rack space and power efficiency.	1	1		
1.8	Each compute node should be populated with at least physical configuration of 512 GB memory and minimum 128 cores logical or physical cores per compute node, using at least 60M L3 Cache	1	1		

1.9	The compute hardware must support Low Reduce DIMM (Dual In-Line Memory Module) or RDIMM (Registered Dual Inline Memory Module) memory technology for high capacity RAM, at least DDR5 smart memory.	1	1	1
1.10	The compute hardware must support HDD, SSD, PCIe SSD/NVMe disks.	1	1	0
1.11	The compute hardware must be possible to interconnect to multiple storage pools using HBA/SAS.	1	1	0
1.12	The compute hardware must be possible to boot from disk in storage blade/sleds.	1	1	0
1.13	The compute hardware must be able to access via remote KVM (Keyboard-Video-Mouse).	1	1	1
1.14	The compute hardware must use network interface card that support DPDK, SR-IOV and PCI-pass-through.	1	1	0
1.15	The compute hardware must use network interface card that support Pre-boot Execution Environment (PXE) that allow PXE booting	1	1	0
1.16	The compute hardware will use network interface card that support 10G or 25GbE or 40GbE or 100GbE	1	1	1
1.17	The compute hardware must support out-of-band system management using IPMI interface	1	1	0
1.18	The compute hardware shall support all major Operating System such as various distribution of Red hat Linux, Microsoft Windows.	1	1	0
1.19	The compute hardware shall support Intel Service Assurance, to take metrics such as:			
	a. Huge-page Usage			
	b. Intelligent Platform Management Interface (IPMI) Information Retrieval			
	c. CPU Performance Counter Monitoring	4		2
	d. Virtual Machine Monitoring			
	e. Open vSwitch Interface Monitoring			
	f. DPDK Interface Monitoring			
	g. SNMP Reporting			
1.20	The compute hardware shall support Trusted Platform Module (TPM) microcontroller that can be used for device identification, authentication, encryption, measurement and device integrity.	1	1	0
1.21	Servers must have hardware support for VT-x or equivalent technology.	1	1	0
2	Storage Domain	8	5	
2.1	The storage infrastructure must support standard 2.5" or 3.5" form factors of HDD and SSD drives with single/dual SAS interfaces or SATA	1	1	1
2.2	The storage infrastructure must support direct attach disks to compute sled/blades using HBA/SAS.	1	1	0
2.3	The storage infrastructure must support dual 1+1 redundant, hot swap power supply unit	1	1	1

2.4	The storage infrastructure shall support at least one of RAID 0,1,5,6 configuration.	1	1	1
2.5	The storage infrastructure shall support hot-swap and hot-pluggable disks.	1	0	
2.6	The storage infrastructure shall support for out-of-band management of disk controllers using IPMI	1	0	
2.7	The storage infrastructure shall have minimum 2 high performance fan module integrated in each power supply unit, front to rear system cooling.	1	1	
2.8	The storage infrastructure shall have n+1 redundant cooling, the system would continue operating when any of the fans fail.	1	1	
3	Networking Domain	23	17	
3.1	The networking infrastructure shall support networking datacentre fabric capabilities including switching, routing and optionally support in-fabric analytics as integrated fabric switch.	1	0	
3.2	The bidder must provide network topology to physically separate Data fabric and Control fabric domain	1	0	
3.3	The networking infrastructure shall support leaf & spine & border leaf architecture as one switch with CLOS fabric principle and single control interface from the fabric. The leaf & spine & border leaf switches shall be physically separated.	1	1	
3.4	The POD spine switches should enough ports and switching capacity to serve up to 1Tbps gross bandwidth and support 100GbE interfaces	1	1	
3.5	The networking switches should be provided with 1 + 1 redundancy so that the loss of any single network device can be tolerated	1	1	
3.6	Servers must have hardware support for SR-IOV technology	1	0	
3.7	The networking infrastructure shall support minimum L2 services mention below:			
	a. 802.1Q VLAN;			
	b. Port Mapped VLAN;			
	c. 802.1AB Link Aggregation (LACP);	1	0	
	d. Multi-Chassis Link Aggregation			
	e. Jumbo Frames			
	g. Bandwidth limitation management			
3.8	The networking infrastructure shall support up to 4,000 VLANs partition.	1	0	
3.9	The networking infrastructure must have loop prevention mechanism on server ports.	1	0	
3.10	The networking infrastructure shall support configurable LACP	1	0	
3.11	The networking infrastructure shall support VxLAN services:			
	a. VxLAN HW VTEP provides VxLAN gateway by switching between VLANs and VxLAN VNIs	1	0	

	b. VxLAN HW VTEP redundancy, a redundant pair of HW VTAP in a switch cluster can appear as a unified VTEP identified by an virtual IP address to allow's transparent use for LAG mapping to a VNI.			
3.12	The networking infrastructure shall be able to provide switch and port status, port alarms.	1	0	
3.13	The networking infrastructure shall support full IPv6, IPv4 and dual stack	1	1	
3.14	The networking infrastructure must support L3 services and L3 routing services, L3 gateway services	1	0	
3.15	The networking infrastructure shall support slicing of physical network into logical networks, making fabric services separated and controlled for each instantiated logical networks.	1	0	
3.16	The networking infrastructure shall support in-fabric analytics for TCP connections and virtual ports location showing VM location and attachment to data network fabric.	1	0	
3.17	The networking infrastructure shall support backup and restore of data network configuration that can be saved (backup) for later restoration.	1	0	
3.18	The networking infrastructure shall support retrieval of inventory information of the switch fabric.	1	0	
3.19	The networking infrastructure shall support network automation such as:			
	a. Automated connectivity discovery through LLDP			
	b. Automated L2 fabric configuration with fabric reference topologies can be configure without need to configure individual switches.	1	0	
	c. Automated IP configuration of L2 fabric, IP forwarding configuration is automated and used together with VxLAN overlay.			
3.20	The networking infrastructure shall be able to be integrated with Openstack through plugins.	1	0	
3.21	The networking infrastructure shall support network management connected thru control network using REST API.	1	0	
3.22	The networking infrastructure shall be possible to have different instances of OpenStack Neutron and VM-Ware NSX managing the different partitions without interference.	1	0	
3.23	The networking infrastructure shall support broadcast suppression technologies to optimize large L2 topologies.	1	0	
4	Hardware Resources Management	16	11	
4.1	The PIM(Physical Infrastructure Manager) shall support settings: The infrastructure must offer northbound APIs to control these settings so that the VIM or other orchestration entities can manage this higher up in the stack			
	the PIM(Physical Infrastructure Manager) shall support firmware management including upgrade, update...PIM needs to offer northbound APIs that provide programmatic and fine grained control that can be utilized by VIM and upstream orchestrators to automate the entire workflow	1	0	
	The proposed Hardware Resource Management shall support access to all services through redundancy and high availability capabilities			
4.2	The resource management shall support management of multi-vendor infrastructure using API: Vendor describe the solution (some APIs can be used like RESTful, IPMI, DMTF Redfish or Intel RSD)	1	0	

4.3	The resource management shall have the capability to create separate performance optimized datacenter (POD) created in a set of hardware resources, separated both in terms of data that is specific to a particular POD as well as networking. Choosing hardware that will be part of a POD, configuring the necessary networking connectivity, and assigning the necessary access rights to allow the POD owner to manage certain aspects of the POD itself while prohibiting activity not related to the POD	1	0	
	The resource management shall be able to create appropriate permissions to create PODs with appropriate hardware and networking configurations as well as giving an overview of currently allocated PODs and their resource consumption.			
	The resource management shall be able to keep information from one POD shall not leak to a different POD while optimizing utilization of the resources within the POD.	1	0	
4.4	The resource management shall support network switches management connected through control network using REST API.			
4.5	the system shall support power management: Programmatic management of the power lifecycle of a server is required for providing the resiliency required by Telco applications.	1	1	
4.6	PIM shall support :			
	a.Hardware Discovery and Inventory			
	b.Metrics and Event Collection which metrics can be collected from monitored devices using for example Redfish, IPMI and SNMP.			
	c.Metrics Visualization and analytics which can do analytics for the metrics and raises / clear alarms in fault conditions			
	d.Alarm Management			
	e.Hardware Firmware Update and Configuration Management			
	f.Role based user management and fine-grained resource access control			
	g.Device access via Out of Band management protocols such as Redfish, IPMI and SNMP.	3	0	
	h.Server Operating System Provisioning			
	i.Power Management which can monitor cumulative power consumption of the system			
	k.Remote Console Access			
	l.Interoperability with upper management layers, O&M and orchestrating systems			
4.7	m. Dashboard which can show the overall status of the Datacenter and it can be customized.			
	n. Thermal Management can monitor thermal information of the system			
	PIM shall have Web User Interface and RESTful API for further Northbound interface integration	1	0	
4.8	the PIM shall support Physical Infrastructure Health, fault detection and isolation capabilities, including predictive detection of faults by monitoring and analyzing a number of internal server metrics like temperature, bad disk sectors, excessive memory faults, etc. A programmatic interface is required so upstream systems can take advantage of these alerts and take action quickly or before the faults impact the service.	1	0	

4.9	the system shall support the platform lifecycle management, allowing subcomponents to be upgraded the firmware of redundant components in a rolling manner with minimal or no impact to service availability	1	0
4.10	The resource management network must be physically separated out-of-band management.	2	0
4.11	The resource management shall support faults detection as alarms, can be viewed and stored in order of severity.	1	0
4.12	The resource management must support carrier-grade High Availability architecture	1	0
4.13	The resource management must be able to collect resource utilization (interface, CPU, memory...)/system health & status (uptime, network error,...) from switching fabric and expose to external system through API/SFTP/SNMP,...	1	0
III	Network Function Virtualization Infrastructure Requirements	131	103
1	General for Network Function Virtualization Infrastructure	12	8
1.1	Interfaces of proposed solution must functionally map ETSI NFV defined reference points. Please provide mapping between reference points and defined interfaces.	2	2
1.2	Please provide table mapping functional capabilities of ETSI NFV defined reference points and your implementation.	1	0
1.3	All the interfaces, the openstack components, must be opened for multi vendor integration	1	0
1.4	The capacity, licenses, features, ... of NFVI must be ready for the orchestration integration	1	1
1.5	The NFVI and MANO must be compatible with the ETSI latest recommendations/technical specifications for functions, interfaces...	1	1
1.6	The NFVI must be able to integrate with VNF of different applications like UDC, EPC, IMS, SBC, PCRF,... of other vendors	1	1
1.7	The NFVI must be ready for integration with different kind of hardware of other vendor.	1	1
1.8	Compute H/W should be based on rack-based server without any internal switching fabric to fully realize the benefits of I/O accelerations such as SR-IOV /PCI-PT	2	0
1.9	The VNFM must be aligned with the ETSI reference model for NFV.	1	1
1.10	Compute networking should be directly from server NIC card to ToR switch fabric to minimize latency for High I/O applications	1	1
2	HYPERVISOR REQUIREMENTS	53	41
2.1	Openstack Support	2	2
2.1.1	The proposed hypervisor domain must be based on Openstack minimum release Victoria with the least components below:		
	a. Neutron, network service provide network connectivity as a service between interface devices managed by Openstack		
	b. Nova, compute service provides virtual server upon demand	1	1
	c. Glance, OS image service provide a catalog and repository for virtual disk images		
	d. Swift, object storage service allows storage and retrieval of objects.		

	e. Cinder, block storage service provides persistent block storage to guest VMs			
	f. Keystone, identity management service provides authentication and authorization for all Openstack services			
	g. Telemetry based on Victoria metrics, data collection service provide performance measurement, counter and alarm information for charging and monitoring			
	h. Heat, orchestration service launches multiple composite cloud applications based on templates.			
	i. Horizon, dashboard service framework			
2.1.2	The proposed hypervisor domain shall support access to all services through redundancy and high availability capabilities.	1	1	
2.2	Virtual Compute Domain	30	23	
2.2.1	The hypervisor domain shall be based on KVM (Kernel-based Virtual Machine)	1	1	
2.2.2	The hypervisor domain must support partitioning of the resources of a compute node.	2	2	
2.2.3	The hypervisor domain must support config-drive	2	2	
2.2.4	The hypervisor domain must support NUMA (Non-uniform memory access) topology exposure allows VMs to have optimal resource access.	2	2	
2.2.5	The hypervisor domain must support NUMA-aware memory allocation allows tenant resources to be bound to the same CPU socket for highest performance.	2	2	
2.2.6	The hypervisor domain must support configurable NUMA policy enables vCPUs, RAM and PCI device to be allocated on the same NUMA node. NUMA policy can stop propagation of VMs starting across multiple NUMA nodes in a single server.	2	2	
2.2.7	The hypervisor domain must support para-virtualization driver such as VirtIO, a virtualization technique that present a software interface to VMs that is similar, but not identical to, that of the underlying hardware. Interact directly with the virtualization platform (with no emulation) to deliver disk and network access efficiently.	1	0	
2.2.8	The hypervisor domain must support partitioning of the resources	1	0	
2.2.9	The hypervisor domain must support a deployment option where VMs can be given exclusive access to specific CPU cores (CPU-pinning)	1	1	
2.2.10	The hypervisor domain must support a deployment option where VMs can be given exclusive access to allocated memory regions	1	1	
2.2.11	The hypervisor domain must support a deployment option where VMs can be given control of physical devices to guests: PCI pass-through to assign a PCI device (NIC, disk controller, HBA, USB controller, firewall controller, soundcard, etc) to a virtual machine guest, giving it full and direct access to the PCI device.	1	0	
2.2.12	The hypervisor domain must support a deployment option where VMs can be given a single physical PCI Express that can be shared on a virtual environment using the SR-IOV specification, allows different virtual machines (VMs) in a virtual environment to share a single PCI Express hardware interface.	1	0	
2.2.13	The hypervisor domain must prevent VMs from “escaping” to the hypervisor, VMs are protected and isolated from other VMs in the environment (several vulnerabilities on different hypervisors have been reported, which allows a VM to escape to the hypervisor).	1	0	

2.2.14	The hypervisor domain must implement proper authentication and authorization mechanisms to prevent unauthorized users from accessing the hypervisor and perform malicious activities. Different account with different roles must be implemented. Audit trails logs must be implemented.	1	0
2.2.15	The hypervisor domain must implement control about which hypervisor accounts are capable of managing specific VMs in the cloud environment.	1	0
2.2.16	The hypervisor domain shall support booting from network using standardized client-server environment that boots a software assembly retrieved from a network on PXE-enabled clients, allow PXE booting.	1	0
2.2.17	The hypervisor domain shall support huge page with minimum of 1GB page size.	1	1
2.2.18	The hypervisor domain shall support VM evacuation, provide capabilities to move a VM from one compute host to another compute host.	2	2
2.2.19	The hypervisor domain shall support launch, rebuild, reboot, restore, rescue, shutdown instance	1	1
2.2.20	The hypervisor domain shall support stop/resume CPUs (pause/unpause)	1	1
2.2.21	The hypervisor domain shall support saving snapshot of instance disk	1	0
2.2.22	The hypervisor domain shall support a deployment option where the vSwitch functionality is deployed independently from the served hypervisor.	1	0
2.2.23	The hypervisor domain shall support a deployment option where the vSwitch functionality is hosted in a VM.	1	0
2.2.24	The hypervisor domain shall support a deployment option where VMs are directly connected with each other via their vNICs (i.e. point-to-point communication), not using any vSwitch, vRouter or eSwitch.	1	0
2.3	Virtual Storage Domain	11	7
2.3.1	The virtual storage infrastructure must be able to attach/detach block volume to instance	1	1
2.3.2	The virtual storage infrastructure must be able to attach tagged block device to instance	2	0
2.3.3	The virtual storage infrastructure must be able to swap block volumes	2	0
2.3.4	The virtual storage infrastructure must be able to limit the Instance disk I/O	2	0
2.3.5	The virtual storage shall support SAS (Serial Attached SCSI)	2	0
2.3.6	The virtual storage infrastructure must support image storage	2	0
2.4	Virtual Networking Domain	10	7
2.4.1	The hypervisor domain must support attach/detach virtual network interface to instance	1	0
2.4.2	The hypervisor domain must support tagged virtual network interface to instance	1	0
2.4.3	The hypervisor domain must support network firewall rules	1	0
2.4.4	The hypervisor domain must support network routing	1	0

2.4.5	The hypervisor domain must support network security groups	1	0
2.4.6	The hypervisor domain must support flat networking	1	0
2.4.7	The hypervisor domain must support VLAN networking	2	0
2.4.8	The hypervisor domain must support VLAN trunking to have multiple vLANs per vNIC connecting to external network, enable VMs with flexible usage of vLANs to separate application subnetworks in cloud environment.	2	0
3	VIM REQUIREMENTS	52	40
3.1	NFVI - Virtualization Infrastructure Management	28	21
3.1.1	VIM must support verities of telecom applications such as EPC, IMS, SBC...,	1	1
3.1.2	The virtualization layer abstracts the hardware resources and decouples the VNF software from the underlying hardware. This includes hypervisors, Virtual machines for compute, virtual storage and virtual network paths for providing connectivity between the VMs.	1	1
3.1.3	The Solution must support interfaces to decouple the VNF associated software instances from the underlying infrastructure.	1	1
3.1.4	The hypervisor must allow portability of the VNF/VM/Application across standard COTS hardware.	1	1
3.1.5	The VIM must control and manage the physical server's compute, storage and network resources.	1	1
3.1.6	The solution must support virtualization software which has ability to provide support for both IPv4 and IPv6.	1	1
3.1.7	Solution should ensure minimal or no downtime by providing specific mode for maintenance and host patching allowing moving workload to different hosts within the same cluster. Please explain the solution techniques in maintaining a little or zero downtime.	1	0
3.1.8	Solution should support saving virtual machine as a template than can be instantiated later.	1	0
3.1.9	Virtualization solution should be able to live migrate virtual machines between openstack compute server while the instance continues running.	1	0
3.1.10	The solution must be able to live migrate the virtual machines between hosts.	1	0
3.1.11	The VIM must provide the information about resource availability for scaling, to VNF manager.	1	0
3.1.12	The virtualization solution should interface with VNF manager to support the VNF life cycle management and support in scale in and scale out operation.	1	0
3.1.13	The VIM must be based on Pike or later release of OpenStack	1	0
3.1.14	The VIM shall support interfaces Nf-Vi, Or-Vi, Vi-Vnfm as standardized by ETSI	1	1
3.1.15	The solution must support SR-IOV. Please provide the details.	1	0
3.1.16	The Vendor shall indicate if the solution supports automatic restart of a VM when the compute node on which it runs restarts (e.g. due to a compute node failure).	1	0

3.1.17	The VIM must support Jumbo frames (frames with MTU size greater than 1500 bytes)	1	0
3.1.18	The VIM must support pre-define vNIC MAC address.	1	0
3.1.19	The VIM will support upgrade and rollback, pre-package releases with orchestrated upgrade and rollback.	1	0
3.1.20	The VIM shall be able to do backup and restore services covers for infrastructure.	1	0
3.1.21	The VIM shall support to deploy under cloud and controller on dedicated physical compute/server.	1	0
3.1.22	VIM shall support expansion of capacity by adding more servers easily with a GUI tool.	1	0
3.1.23	The infrastructure computes must be configured with CPU isolation for the host and shall be configurable during the installation.	1	0
3.1.24	The VIM shall support different options for server setup such as SR-IOV and OVS-DPDK and shall be able to easily select via GUI during installation or during adding servers.	1	0
3.1.25	Installation GUI must include support for different HW flavors.	1	0
3.1.26	Upon failure of any part of infrastructure, platform must be able to determine which VMs are impacted by failure and raise appropriate alarms.	1	0
3.1.27	VIM shall check and validate that the existing infrastructure supports the specific requirements of the VNF such as compute resources, SR-IOV/DPDK/Huge pages requirements prior to VNF instantiation	1	0
3.1.28	VIM shall provide fault and performance management of the hardware and software components including servers, network switches, storage, OpenStack services that are provided in the proposal.	1	0
3.2	Virtualization Management for High Availability	8	5
3.2.1	The VIM must support affinity and anti-affinity policy enable hypervisor to control VM placement together or separated on physical compute host following affinity and anti-affinity rules.	1	0
3.2.2	The VIM must support persistent anti-affinity rules honoring the application deployment without relying on additional empty hardware capacity for that function.	1	0
3.2.3	The VIM must support VM high availability where VM can be evacuated when compute node failure or when the current host needs to be take out of service for maintenance. Automatic evacuation is performed by rescheduling VMs to compute nodes honoring anti-affinity and persistence anti-affinity rules.	1	0
3.2.4	The VIM must provide mechanism for failure detection of the host OS on the underlying hardware.	1	0
3.2.5	The VIM must be able to restart the failing VMs or hosts.	1	0
3.2.6	The VIM shall detect hanging processes and ability to take action based on this.	1	0
3.2.7	The Vendor shall indicate the start, restart and stop procedures of both controller (management) and compute nodes. The Vendor shall also clarify the impact of such operations on running services (i.e. on both OpenStack control modules and running VMs).	1	0
3.2.8	The VIM shall support high availability feature for OVS compute. So that, once a compute will be failed, VMs which are running on the compute failed can continue the service on different compute nodes.	1	0
3.3	Virtualization Management for Security	6	3

3.3.1	The VIM must support Identity and Access Management for infrastructure using LDAP/Radius database.	1	0
3.3.2	The VIM must provide audit trail logging access	1	0
3.3.3	The VIM must support complete virtual machine isolation from each other, from the VIM and resources allocated are guaranteed.	1	0
3.3.4	The VIM must provide secure interface for Openstack API with TLS to cloud management.	1	0
3.3.5	The VIM shall support security groups and port security	1	0
3.3.6	The VIM shall use Reliable Event Logging Protocol (RELP) for distributing log in secure and real time streaming manner.	1	0
3.4	Virtualization Management Dashboard	9	6
3.4.1	The VIM support web based interface to Openstack services including nova, swift, keystone, neutron, heat, telemetry.	1	0
3.4.2	The VIM must support zone placement for controlled use of resources for applications, example for geo-redundancy, security and business reasons.	1	0
3.4.3	The VIM must support placement zones with region, availability zone, virtual hardware template (CPU, RAM, disk size and host aggregate) that can be define as part of the VNF descriptor.	1	1
3.4.4	The VIM shall support VNFM to perform lifecycle management using OVF, HOT, TOSCA VNFD format	1	0
3.4.5	The VIM shall support display of alarm notification, alarm list and access list in management dashboard	1	0
3.4.6	Solution should provide a centralized management platform to manage virtual components and hosts. Please describe the capabilities in details.	1	0
3.4.7	Virtualization solution should support browser based management feature.	1	0
3.4.8	Solution should provide a centralized virtual network management interface.	1	0
3.4.9	Upon failure of any part of infrastructure, platform must be able to determine which VNFs are impacted by failure and raise appropriate alarms.	1	0
3.5	VIM shall support the alarm functions, including:	1	0
	collect alarms raised by various components;	1	0
4	VNF-M REQUIREMENTS	14	10
4.1	The solution shall include S-VNFM or G-VNFM capabilities as required. The VNFM shall be capable of managing multiple virtual functions	1	1
4.2	The VNFM shall support orchestration in several VIM instances	1	1
4.3	The VNFM Manager shall support standard APIs for all applicable functions (e.g. VNF instantiation, VNF instances allocation/release of NFV infrastructure resources, VNF instances scaling, VNF instances termination, and policy management)	1	1
4.4	The solution must use VNF descriptors (VNFDs) to manage the life cycle of a VNF. These descriptors consist of a template with the operational and deployment requirements of the VNF, which is stored in a catalog during the on-board commissioning of the function.	1	1

4.5	Support the configuration management of the VNF instance, complying with the following:			
4.6	> During the instantiation establish initial configuration parameters and any configurable parameter defined in the VNFD descriptor.	1	0	
4.7	> Update the configuration parameters of an existing VNF.			
4.8	Support the management of virtualized resources, fulfilling the following functions and characteristics:			
4.9	- Coordinate with the VIM and the orchestrator the request and allocation of resources for the instantiation, scaling and termination of the VNFs;	1	0	
4.10	- Request resources that comply with the VNF requirements defined in the VNFD, including acceleration resources;			
4.11	- Create, query, update and delete the allocation of virtual resources through the VIM (in the direct model only).			
4.12	Support the life cycle management of the VNF instances, taking into account the information contained in the VNF descriptor and complying with the following functions and characteristics:			
4.13	Instantiation of the VNF, configuring the specific parameters of the deployment;			
4.14	Query VNF instance;			
4.15	Scaling the VNF automatically or responding to requests from the VNF instance, the network element manager (EMS) or the orchestrator.;	1	1	
4.16	Termination of a VNF instance, requesting the release of the resources to the VIM or the orchestrator depending on whether it is the direct or indirect management model, respectively;			
4.17	> Notify the orchestrator of life cycle events such as component creation and deletion, instantiation, etc.			
4.18	> Start or stop the VNF instance			
4.19	Provide an interface between the network element manager (EMS) and the VIM, coordinating and adapting the data flow for life cycle management events between these two entities.	1	0	
4.20	Must provide GUI and APIs to upload and deploy VNF packages that define the virtual objects to be created in the VIM.	1	0	
4.21	The NFVI have already VNF of other Vender onboarded and commercial deployed, please provide references. If public, provide the names of the service providers.	1	0	
4.22	A VNFM shall be integrated to the solution in order to have a central VNFM function supporting VNFs from the solution, and could be evolved to support VNFs from different vendors.	1	0	
4.23	Each stage of VNF lifecycle shall be customized (e.g. new triggers can be added, new actions can be configured etc.). Please provide description how it can be done if this functionality is available	1	0	
4.24	VNFM shall provide a capability to do a commissioning of VNFs as apart of VNF instantiation in order to fulfill a need for initial configuration of the VNFs.	1	0	
4.25	Or-Vnfm interface must be clearly defined regardless of VNFM being Generic VNFM or Specific VNFM.	1	0	
IV	Cloud Native Requirements	131	103	

1	General for Cloud Native	11	7
1.1	In case of the vendor provide the application solution base on Cloud Native, it must be satisfied the requirements below:		
1.2	All the interfaces, the cloud native infrastructure components, must be opened for multi vendor integration	2	0
1.3	The capacity, licenses, features, ... of Cloud Native Infrastructure must be ready for the orchestration integration	2	2
1.4	The Cloud Native Infrastructure must be able to integrate with CNF of different applications like AMF, SMF, UPF, NRF,... of other vendors	2	2
1.5	The Cloud Native Infrastructure must be ready for integration with different kind of hardware of other vendor.	2	2
1.6	Compute H/W should be based on rack-based server without any internal switching fabric to fully realize the benefits of I/O accelerations such as SR-IOV	2	0
1.7	Compute networking should be directly from server NIC card to ToR switch fabric to minimize latency for High I/O applications	1	1
2	Container Requirements	106	83
2.1	General	5	5
2.1.1	CaaS in proposal shall be a CaaS on premises solution.	1	1
2.1.2	The CaaS shall be a CNCF® certified Kubernetes distribution to ensure compatibility with the larger Kubernetes ecosystem	1	1
2.1.3	The CaaS shall support to deploy on Openstack-based NFVI or bare-metal. Vendor shall provide and describe propose solution and detail.	1	1
2.1.4	The CaaS shall provide the ability to manage NFs containers as well as configure, deployment, load balancing, autoscaling and manage clusters of containers.	1	1
2.1.5	The CaaS shall support Kubernetes version 1.27 or later.	1	1
2.2	Architecture	14	6
2.2.1	A CaaS cluster shall consists of a set of worker machines, called worker nodes, that run containerized applications and control plane components that run on master machines, called master nodes, that manage the worker nodes/the pods in the cluster.	1	1
2.2.2	The proposed solution shall be integrated with a Storage cluster to provide storage service to container.	1	0
2.2.3	The CaaS shall support HA Architecture for the High availability of the Master/Control Node Cluster.	1	1
2.2.4	The CaaS shall support HA Architecture for the High availability of the Worker Node Cluster.	1	1
2.2.5	The CaaS shall support node pools or equivalent features to group nodes that share the same configuration such as Hardware, CPU, Memory, Networking, OS, maximum pods, etc.	1	0
2.2.6	The CaaS shall provide Container Runtime Interface (CRI), which defines an API between Kubernetes and a container runtime underneath.	1	0
2.2.7	The CaaS shall provide a High-Level Container Runtime that implements the CRI specs. It is responsible for pushing and pulling container images to/from registries, manages storage and networking and supervises the running of containers, etc. It launches a	2	1

	Low-Level Container Runtime to create and run container processes. The High-Level Container Runtime in the following list is accepted: - Docker/Containerd - CRI-O - Rkt				
2.2.8	The CaaS shall support Open Container Initiative (OCI) compliant images for deployment and execution of containerized application contents.	1	1	1	
2.2.9	The CaaS shall provide a Low-Level Container Runtime that implements the OCI specification and runs the container process such as runc, kata-runtime, etc.	1	0	0	
2.2.10	Vendor shall provide a container image registry to store container images. Vendor to specify the list of supported container image registry and its versions.	1	1	1	
2.2.11	The CaaS shall support the capability to manage multiple versions of container images.	1	0	0	
2.2.12	The CaaS shall provide the support list of Operating system (OS) for Master and Worker nodes. I.e: CentOS, Ubuntu, RedHat, SLES..	2	0	0	
2.3	Container Networking	28	16		
	Networking shall be based on the standard Kubernetes model, which addresses the following:				
	- Container-to-container communication within a pod				
2.3.1	- Pod-to-pod communication	4	2	2	
	- Pod-to-service communication				
	- External-to-service communication				
2.3.2	Container-to-container communication within a pod: Containers within a pod shall share an IP address and port space and can find each other through localhost. Containers can communicate with each other using standard inter-process communications.	2	2	2	
2.3.3	Pod-to-pod communication: Containers in different pods shall have distinct IP addresses and communicate with each other through pod IP addresses.	1	0	0	
2.3.4	Pod-to-service communication: The CaaS shall support iptables or IPVS to load balance traffic to service endpoint pod(s) for pod-to-service communication.	1	0	0	
2.3.5	The CaaS shall support software based ingress Load balancer for container applications. Vendor to specify the supported load balancer and its versions. Vendor to specify if any external load balancer or hardware based load balancer is required.	2	2	2	
2.3.6	Each CaaS cluster shall have a dedicated External Load Balancer instance, i.e, not shared across clusters, and activated as a default part of the cluster.	2	2	2	
2.3.7	The External Load Balancer shall support the use of TCP, UDP and SCTP protocols.	1	1	1	
2.3.8	The External Load Balancer shall be integrated with Kubernetes Service of type Load Balancer in CaaS clusters. External IP defined in Kubernetes Service descriptors shall be allocated automatically to the Service by the Load Balancer.	1	0	0	
2.3.9	The External Load Balancer shall support BGP or equivalent protocols to automatically advertise the External IP assigned to Service of type Load Balancer to external networks.	1	0	0	

2.3.10	The External Load Balancer shall support BFD for fast failure detection and failover	1	0
2.3.11	For load balancing and traffic handling from service to pod's (i.e. ingress traffic), the External Load Balancer shall support:		
2.3.12	- Cluster traffic policy: the Load Balancer forwards ingress traffic to a service endpoint pod(s) on any worker node in the cluster.		
2.3.13	- Local traffic policy: the Load Balancer forwards ingress traffic to a service endpoint pod(s) on worker nodes hosting the target pod(s).		
2.3.14	The Load Balancer shall support VRF to separate traffic to/from worker nodes.		
2.3.15	The CaaS shall support IPv4, IPv6 and dual-stack.		
2.3.16	The CaaS shall provide Container Networking Interface (CNI) in lists or any support please list:		
	- SR-IOV	4	2
	- SR-IOV DPDK		
	- Calico		
	- Multus		
	- Macvlan		
	- IPAM		
	- OVS		
2.3.17	The CaaS shall support VLAN trunking to have multiple VLANs per vNIC connecting to external network, enable containers with flexible usage of VLANs to separate application subnetworks in containerized environment.	1	1
2.3.18	The CaaS shall support to attach multiple secondary network interfaces to containers with different underlying CNI plugin.	1	1
2.3.19	The proposed solution shall support data plane acceleration through SR-IOV and DPDK allowing a single PCIe device configured as multiple virtual devices and they appear as independent network functions to containers.	1	1
2.3.20	DPDK for data plane acceleration shall use huge pages 2M or 1G to improve overall application performance and reduces latency.	1	0
2.3.21	The proposed solution shall support to use Mellanox and Intel NIC for data plane acceleration through SR-IOV and DPDK.	1	0
2.3.22	CPU pinning and isolation shall be supported for worker nodes on which DPDK application pods run to enable data plane acceleration.	1	0
2.3.23	The CaaS shall support Jumbo frames (9000 bytes).	1	1
2.3.24	The proposed solution shall support network interfaces link redundancy, i.e, in case of failure of one physical port, the remaining physical port must be able to handle traffic	1	1
2.4	Container Storage	8	5
2.4.1	The CaaS shall support Ephemeral storage of type "scratch-space", emptyDir, configMap and Secret	1	1

2.4.2	The CaaS shall support Local Persistent Volume (LPV) for high performance and low latency for storage operations. The LPV is stored on local disks and its lifecycle must be decoupled from the lifecycle of pod	1	0
2.4.3	The CaaS shall support Persistent Volumes (PV) which are stored on a storage backend	1	1
2.4.4	The CaaS shall support dynamic provisioning of persistent volumes through CSI plugin.	1	0
2.4.5	The CaaS shall support static provisioning of persistent volumes, i.e., the administrator can manually create volumes in the storage backend and create the corresponding Persistent Volumes in CaaS cluster	1	1
2.4.6	The CaaS shall support expansion of Persistent Volumes using the Kubernetes API.	1	1
2.4.7	Vendor shall provide a storage backend to store Persistent Volumes, the storage backend shall be a Software-Defined Storage solution such as Ceph/OpenZFS/VxFlex, etc. and associated CSI drivers	1	0
2.4.8	The proposed Storage solution for CaaS shall provide HA support.	1	1
2.5	Container Orchestration/Automation	25	11
2.5.1	Container orchestration tools shall be defector standard (kubernetes), vendor shall provide container orchestration tool in proposal.	1	0
2.5.2	The Bidder shall provide details on architecture and component of the proposed container orchestration platform tools.	1	0
2.5.3	A common API shall be defined and standardized for all operations what are used on the Container Management and Orchestration software components by the (Telecom) Application. In this way only this common API should be supported by the Telecom Applications to implement the Container management and orchestration assisted membership management, service discovery and monitoring features.	1	0
2.5.4	For optimal performance of a DPK application pod, the assigned CPUs, PCIe network devices and huge page memory assigned to the pod by the CaaS shall typically all be located on the same NUMA node of the computer system	1	0
2.5.5	The CaaS shall support container affinity and anti-affinity rules: - When an anti-affinity rule is defined between any numbers of Containers, the Container orchestration component ensures that all of the mentioned Containers are started on different worker nodes. - In case of an affinity rule is defined between Containers the Container orchestration component ensures that all of the Containers are started on the same worker nodes.	1	1
2.5.6	The proposed solution shall support Service discovery and Load balancing and traffic routing. There must be no need to modify application to use an unfamiliar service discovery mechanism. Containers must have their own IP addresses and a single DNS name for a set of containers, and can load-balance across them.	1	1
2.5.7	The CaaS shall support Storage orchestration, i.e., automatically mount the storage system of choice, whether from local storage, or a network storage system such as NFS, iSCSI, Gluster, Ceph, Cinder, or Flocker.	1	1
2.5.8	The CaaS shall support download or export Container image for Container deployment in other CaaS	1	0
2.5.9	The CaaS shall provide Package Management, for installation, upgrade, configure, fetch software package such as Helm, Tiller	1	0
2.5.10	The CaaS shall provide tool to support batch container management	1	1
2.5.11	The CaaS shall support to detect at least but not limit to all failures/issues as following:	3	1

	- Hanging processes.				
	- Container failure				
	- Host OS or underlying hardware that cause compute host failure				
2.5.12	The CaaS shall be able to restart the failing containers automatically	1		1	
2.5.13	The CaaS shall be able to create a replacement container for the failing container	1		1	
2.5.14	The CaaS shall be able to replace and reschedule containers when nodes die	1		1	
2.5.15	The CaaS shall be able to detect if a service endpoint pod is not ready to handle traffic and remove it from Service. The other service endpoint pods must be able to take over handling traffic.	1		0	
	The proposed solution shall support to configure the capacity of Container based on:				
2.5.16	- The number of CPU, RAM, storage.	2		1	
	- Limit the IOPS (Input/Output Operation Per Second) and disk bandwidth.				
2.5.17	The CaaS shall support to change the Container resource configuration while the container is running.	1		1	
2.5.18	The CaaS shall support horizontal scaling for Containers, i.e., scaling or removing containers based on balancing workloads across infrastructure	1		1	
2.5.19	The CaaS shall support the Northbound APIs for managing PODs, Containers	1		0	
	The CaaS shall support on assigning fixed IP addresses for containers;				
2.5.20	- To implement this the container orchestration shall be able to store the IP address in the descriptor of the system and shall be able to provide the IP address to the container management layer.	2		0	
	- The container management layer shall be able to set the IP address to the interface.				
	- The application specific IP address configuration should be handled by the application itself.				
2.5.21	The CaaS shall support Network Attachment Definition (NAD) and Network Resources Injector (NRI) allowing to use manifest to specify which CNI types are used to orchestrate secondary network attachments to containers.	1		0	
2.6	Security	11		7	
2.6.1	The CaaS shall support access restriction to resources on control plane nodes.	1		1	
2.6.2	The CaaS shall support RBAC for accessing The CaaS APIs.	1		1	
2.6.3	The CaaS shall support Namespace to provide isolation between components, environment and usability.	1		1	
2.6.4	The CaaS shall support API authentication based OAuth2.0 for accessing the Cluster.	1		0	
2.6.5	The CaaS shall support Transport Layer Security (TLS) on all control plane connections between CaaS components. In addition, the API endpoints exposed to external systems must be protected by a TLS certificate.	1		1	

2.6.6	The CaaS shall support to encrypt sensitive contents such as Kubernetes Secrets.	1	0
2.6.7	The CaaS shall support scanning vulnerabilities on nodes such as CIS-CAT, Kube-bench, Nmap, Lynis,...	1	0
2.6.8	The CaaS shall support scanning vulnerabilities for container images such as Trivy, EVMS,...	1	0
2.6.9	The CaaS shall support to integrate with third-party identity services to define and authenticate users and groups.	1	1
2.6.10	The CaaS shall support to forward SNMP traps to monitoring systems.	1	1
2.6.11	The CaaS shall support NTP synchronization and audit logs.	1	1
2.7	Operation & Maintenance	15	12
2.7.1	The CaaS shall support the additions or removal of individual worker nodes.	1	1
2.7.2	The CaaS shall support the additions or removal of individual node pools.	1	1
2.7.3	The CaaS shall support Cluster-API with Metal or equivalent function to enable management of the infrastructure - hardware and software	1	0
2.7.4	The CaaS shall support KUBECTL tool for accessing and administrating the Cluster using CLI	1	1
2.7.5	The CaaS shall provide tools such as Prometheus, Grafana, Thanos for monitoring purpose. Vendor to specify supported tools and its versions.	2	1
2.7.6	The CaaS shall have the capability to store all metrics in a time series database with granularity of 1min, 5min, 15min, 30min and 60mins.	2	1
2.7.7	The CaaS shall support backup and restore infrastructure	1	1
2.7.8	The CaaS shall support upgrade and rollback, pre-package releases with orchestrated upgrade and rollback	1	1
2.7.9	The proposed CaaS shall support monitoring with the capability in below lists and describe of detail.	2	2
	- Infrastructure Health check		
	- Cluster Health check		
2.7.10	- Application Health check	1	1
	The CaaS shall support faults detection as alarms, can be viewed and stored in order of severity.		
	The CaaS shall support alarm notifications which can be subscribed using SNMP traps and are sent to subscribers when an alarm is raised and cleared.		
2.7.12	The CaaS alarm entry shall contain information including: Notification time, Resource ID, Alarm ID, Severity, Probable Cause.	1	1
3	CNF-M REQUIREMENTS	14	10
3.1	The solution shall include CNFM capabilities as required. The CNFM shall be capable of managing multiple container functions	1	1

3.2	The CNFM shall support orchestration in several CaaS clusters	1	0
3.3	The CNFM Manager shall support standard APIs for all applicable functions (e.g. CNF instantiation, CNF instances allocation/release of CaaS resources, CNF instances scaling, CNF instances termination)	1	1
3.4	The solution must use deployment template to manage the life cycle of a CNF. These deployment template consist of a template with the operational and deployment requirements of the CNF.	1	0
3.5	Support the configuration management of the CNF instance, complying with the following: > During the instantiation establish initial configuration parameters and any configurable parameter defined in the deployment template. > Update the configuration parameters of an existing CNF.	1	1
3.6	Support the management of containerized resources, fulfilling the following functions and characteristics: - Coordinate with the CaaS and the orchestrator the request and allocation of resources for the instantiation, scaling and termination of the CNFs; - Request resources that comply with the CNF requirements defined in the deployment template, - Create, query, update and delete the allocation of containerized resources through the CaaS (in the direct model only). Support the life cycle management of the CNF instances, taking into account the information contained in the deployment template and complying with the following functions and characteristics: Instantiation of the CNF, configuring the specific parameters of the deployment; Query CNF instance;	2	2
3.7	Scaling the CNF automatically or responding to requests from the CNF instance or the orchestrator.; Termination of a CNF instance, requesting the release of the resources to the CaaS or the orchestrator depending on whether it is the direct or indirect management model, respectively; > Notify the orchestrator of life cycle events such as component creation and deletion, instantiation, etc. > Start/Instantiate or stop/terminate the CNF instance	4	2
3.8	Provide an interface between Orchestrator and the CaaS, coordinating and adapting the data flow for life cycle management events between these two entities.	1	1
3.9	Must provide GUI and APIs to upload and deploy CNF packages that define the containerized objects to be created in the CaaS.	1	1
3.10	CNFM shall provide a capability to do a commissioning of CNFs as apart of CNF instantiation in order to fulfill a need for initial configuration of the CNFs.	1	1

APPENDIX 1: FEATURE LIST

Item	Feature Name	Feature description
1.	AuC	
1.1	Multiple Access Support	Multi Access Support is a standard procedure for user authentication to access different mobility management domains (CS/PS/IMS/LTE) Multi Access Support allows the operator to offer IMS authentication for IMS subscribers using ISIM cards, EPS authentication for LTE subscribers and also GBA authentication. This will be beneficial for both users and operators as they could use existing network authentication mechanism for IMS and LTE as well as they do for WCDMA.
1.2	SIM security	This feature supports subscribers sensitive information that can be protected more adequately. It protects operator database sensitive information in an enhanced secure way in Back-end DB. Subscriber keys (Ki) are one of the most important subscriber data over which the whole security of mobile networks is based. In order to preserve integrity and confidentiality, AUC stores the subscriber keys (Ki) in encrypted form using generically denominated A4 algorithm and A4 keys. Several additional A4 algorithm implementations can be made available to operator together with the possibility of changing the A4 keys used. The A4 key Management and Alternative A4 algorithm shall be supported.
1.3	Authentication security	The Authentication Center (AuC) validates any (U)SIM card attempting network connection when a mobile device has a live network signal, securing subscriber identity and communication confidentiality. Provides 2G/3G authentication and key agreement.
1.4	Authentication data generation	The AuC generates authentication and ciphering data according to the ETSI GSM/3GPP WCDMA specifications. It provides to HSS-FE/HLR-FE the authentication vectors needed by the authentication and ciphering processes used within the network.
1.5	Secure subscriber key management	Supporting AES and DES encryption algorithms
2.	HSS	
2.1	EPC Authentication Support	The EPC authentication support feature manages the authentication procedures defined in 3GPP specifications for the EPC domain, based on USIM Authentication and Key Agreement (AKA). The authentication information retrieval procedure is used by an MME to request authentication information from the HSS. This procedure is mapped to the commands Authentication-Information-Request/Answer in the S6a Diameter application. The authentication in the EPC domain makes use of domain-specific authentication vectors, meaning that authentication vectors generated for other domains are not valid for EPS, and vice versa. These EPS-specific authentication vectors can be requested from an external HLR/AUC.
2.2	EPC Mobility Management	The EPC mobility management feature handles the procedures defined in 3GPP specifications, keeping track of the location of users within the EPS network. End-users can access services and be reached by other end-users or services at any location within the EPC domain. Displacement between different access points serving the EPC network environment does not impose any degradation of the service.

2.3	EPC Operator Determined Barring	This feature provides the operator with means for restricting user activities in the EPC domain. Users can be barred for the following: - All Packet Oriented Services - Roamer Access to access points in the Home PLMN - Roamer Access to access points in the Visited PLMNs The feature thus prevents users from gaining access to EPC services whenever a barring condition applies. The enforcement of the barring is performed in different ways depending on the MME capabilities.
2.4	EPC Subscription Management	The Evolved Packet Core (EPC) Subscription Management feature controls the procedures related to the storage and handling of EPC Users in the HSS server within the network. The HSS handles the following concepts in relation to subscription management: - Subscriber: The paying individual or entity, which comprises one or more users. - User: The individual or entity having a one-to-one relation to a private identity, which in the EPC domain is identified by an IMSI.
2.5	EPC Subscription Profile Configuration	The EPC subscription profile contains the information that defines the service data elements that must be provided to EPC Users. This shared profile information can be configured in the ESM module and referenced from as many EPC Users as needed. The information in the EPC subscription profile includes the following (for further information, refer to TS 23.401 and TS 32.251): - Default Access Point Name (APN) - Allowed APNs - Quality of Service - Subscribed Charging Characteristics - RAT Frequency Selection - APN OI Replacement
2.6	EPS User Location and State Information Support in ESM	The HSS can query MME about EPS location and user state information to be provided to AS over Sh interface. At update location MME can indicate state and location information retrieval support to the HSS. In that case, the HSS can use the S6a Insert Subscriber Data procedure to retrieve state and location information from MME. If location information is requested, MME provides the E-UTRAN cell identity, the tracking area identity, geographical and geodetic information, and age of the location information. When a user state is requested, information includes whether the user is detached, attached, or connected, and in these two last cases whether it is reachable for paging or not.
2.7	ESM Inter-Working with HLR/AuC	The use of this feature allows for the re-use of existing subscriptions in an external HLR/AUC for authentication in the EPC domain.
2.8	MAP Protocol Support	The Mobile Application Part (MAP) is a comprehensive signaling scheme that has been developed for GSM/WCDMA networks. MAP provides necessary signaling procedures required for information exchanges between the HSS and the HLR. The HSS supports MAP-SEND-AUTHENTICATION-INFO, MAP-ANY-TIME-INTERROGATION and MAP-SEND-ROUTING-INFORMATION operations.
2.9	Roaming Restriction based on VPLMN Identity	Whenever an end-user is roaming, the corresponding VPLMN identity can be checked against a pre-configured white list of VPLMN identities, thus enforcing control of whether roaming to that specific VPLMN is allowed.

2.10	Cooperative Load Regulation FE-BE	This feature provides a graceful mechanism that copes with congestion on a given Back-end node (BE-DB), through cooperative actions between the congested node and the FEs. The feature protects the complete UDC system from critical impacts during a single BE node overload situation. The overload situation produced in a BE node is gradually detected by the FE that triggers a throttling mechanism to regulate the traffic towards this particular BE node.
2.11	3GPP SIP Digest	This feature includes the specific support in the HSS for IETF SIP users. This feature adds to the network support of authentication procedures for users that access the Multimedia system with IETF SIP clients. SIP Digest has been selected by OMA for authentication of terminals incapable of IMS AKA.
2.12	Distinct Public Service Identifiers (PSIs) Support	The HSS supports the use of distinct Public Service Identifiers (PSIs) in IMS networks. A PSI defines services hosted in Application Servers. A PSI identifies service profiles related to user groups in application servers which is able to execute the service-specific logic related to that identified PSI. The users establish sessions with these identities to make use of services such as conferencing, chatting, and VoLTE.
2.13	IMS Session Handling and Mobility Management	This feature introduces in HSS support for IMS Session Handling, and for IMS mobility handling, according to the role that the Third Generation Partnership Project (3GPP) has assigned to the HSS in IMS and some Ericsson-specific enhancements. This includes user authorization, server assignment support, IMS location handling, IMS emergency registration and support for terminating IMS sessions with an IMS user. The IMS Session Handling also enables the AS to initiate originating unregistered calls on behalf of the user.
2.14	IMS Subscription Management	The HSS is in charge of storing the IMS user identities and the relationships among them. These identities are used to provide IMS connectivity for a given user. The IMS Subscription Management feature controls the procedures related to the storage and handling of IMS subscription profiles in the HSS server within the network. The HSS handles the following concepts in relation to IMS subscription management: - Subscriber: This concept is typically associated with the paying individual or entity, and it comprises one or more users. - User: The individual or entity having a one-to-one relation to a private identity. - Public identity: The identification that is used for managing communication with other users or services. Both Private & Public identities shall be supported.
2.15	ISIM Support for IMS-AKA Authentication	IMS-AKA is the 3GPP standard authentication and key agreement method for securing IMS communications. When the user connects to the IMS network with an ISIM application, the HSS requests the authentication vectors needed to perform the authentication mechanism from the HLR/AuC entity, and sends them back to the S-CSCF that is authenticating the SIP client.
2.16	ISM Inter-Working with HLR/AuC	This feature allows the re-use of existing subscriptions in an external HLR/AuC for authentication in the IMS domain. The HSS can retrieve authentication vectors from an external HLR/AuC by a standard MAP-SEND-AUTHENTICATION-INFO operation, and use those authentication vectors for IMS domain authentication.

2.17	NASS Bundled Authentication for Wireline Accesses	NASS Bundled Authentication (NBA) is the standardized IMS authentication method for DSL wire-line networks. It allows secure authentication for any type of terminals. NBA is specified in ETSI TS 187 003 and ETSI ES 283 003. The authentication procedure for wire-line networks can be configured to use NBA. The CSCF compares the line identity retrieved from the terminal with the value retrieved from the HSS.
2.18	Roaming Restriction based on IMS Network Domain	The Roaming Restriction feature provides the HSS with a set of mechanisms to support the restriction of roaming either for certain users, to all users in specific visited networks, or both: - Authorization of roaming in visited networks. - Authorization of roaming for the users. With this feature, the HSS checks if the user is allowed to roam at registration. Both restrictions (at network and user level) are checked and have to be successful before the Registration procedure is authorized. If the verification is not successful, the Registration attempt is rejected indicating the appropriate cause.
2.19	Single Sign On (SSO) Authentication for Wireless Accesses	The SSO authentication mechanism relies on the user authentication already performed by the access network (GSM/GPRS and UMTS accesses) to grant a user access to the IMS network. The GPRS-IMS-Bundled-Authentication (GIBA) is the 3GPP standard name for the SSO mechanism (previously known as Early IMS Security). The HSS supports this alternative authentication method that relies on the external authentication performed by another entity within the operator trusted network. The HSS allows the S-CSCF to authenticate a SIP client to register and use the IMS network without the need of that client presenting any credentials or proof of identity to the HSS. The HSS also includes the possibility to authenticate XCAP clients accessing the HSS through Single Sign On (SSO).
2.20	USIM Support for IMS-AKA Authentication	This feature provides a fully compliant 3GPP security solution. IMS Authentication and Key Agreement (AKA) is a security mechanism to provide mutual authentication of the subscriber and the IMS network and full security protection for the SIP signaling traffic between the subscriber and the IMS network.
2.21	Multiple Private Identities	The HSS offers the possibility to define more than one Private Identity (IMPI) per subscriber. Provisioning of 1 to 5 IMPIs under the same Subscription ID shall be supported.
2.22	Multiple Public Identities	The HSS offers the possibility to define more than one Public Identity (IMPU) per subscriber. Provisioning of 1 to 10 IMPUs under the same Subscription ID shall be supported.
2.23	Inter-Working with 3GPP AAA	The HSS supports the use of non-3GPP IP access networks (for example, CDMA2000, WiMAX) to access the EPC, as well as mobility management procedures to handle mobility between 3GPP and non-3GPP accesses, designed to minimize the handover latency owing to authentication and authorization for network access. This function includes: Inter-working with 3GPP AAA server nodes by the SWx interface; Enhancements to S6a procedures for proper mobility management; support EAP-AKA and EAP-AKA' authentication procedures.
2.24	Mobility between E-	The HSS maintains up-to-date location information for users moving from E-UTRAN to 2G/3G accesses and vice versa (IRAT mobility), thus enabling the use of both access networks alternatively.

	UTRAN and 2G/3G Accesses	Two different mechanisms are available for the realization of this feature: - Based on the use of BE-DB: Whenever a user attaches to E-UTRAN, the FE updates location information in the BE-DB, which triggers a notification to HLR FE. The HLR FE in turn checks whether the user was previously located in an SGSN, and in that case HLR FE sends a Cancel Location to the corresponding SGSN. - Based on MAP inter-working with HLR Whenever a user registers to E-UTRAN, the HSS notifies this to HLR by a MAP-ANY-TIME-INTERROGATION operation (with a proprietary extension). The HLR in turn checks whether the user was previously located in a SGSN, and in that case HLR sends a Cancel Location to the corresponding SGSN.
2.25	EPC Roaming Awareness	The HSS allows the definition of roaming control information independently for different tenants, thus supporting multi-tenancy scenarios. This feature allows the definition of HPLMN and VPLMNs to be done separately for a number of tenants (for example, different PLMNs and different regions). Additionally, each user can be assigned to one of the tenants by provisioning. Whenever roaming restriction applies to a user and if the user has assigned a tenant, the roaming restriction checks are performed using the HPLMN and VPLMN lists defined for the corresponding tenant.
2.26	Regional Services Support in ESM	The HSS allows the definition of Regional Subscription information to be provided to the MME for the restriction of user access depending on the tracking area within the PLMN where the user is located.
2.27	CSRN Support in SDA	The HSS provides SCC-AS with Circuit Switch domain Routing Number (CSRN) information, which is used by SCC-AS to route terminating sessions directed to end-users located in the CS domain.
2.28	Enhanced 3rd Party Registration Support	The HSS handles third-party registration IFC prompting the S-CSCF to send to an Application Server (AS) the information sent by the terminal in the SIP REGISTER message. This can be used by the Session Centralization and Continuity Application Server (SCC-AS) for the accomplishment of Single Radio Voice Call Continuity (SR-VCC).
2.29	Single Radio VCC Support in ESM	The HSS provides the MME with an STN-SR value, which allows the handover of an established voice communication over LTE to CS upon the loss of LTE coverage. Moreover, the HSS can receive SR-VCC UE capability information from the MME and make it available through the Sh interface Additionally, the following functionality shall be supported: - A dynamic STN-SR value can be received over Sh that overwrites the provisioned STN-SR, thus triggering an updating the MME. - The HSS can receive SR-VCC UE capability information from the MME in an S6a Update Location Answer and an S6a Notification Request, and make that information available through the Sh interface.
2.30	Single Radio VCC Support in SDA	SR-VCC allows the handover of an established voice communication over LTE to CS upon loss of LTE coverage. To achieve this, the HSS provides the MME with an STN-SR value. This feature allows the SCC-AS/ATCF to read the current STN-SR value and to update it with a new one. Thus a dynamically assigned STN-SR can be used for SR-VCC. Moreover, the HSS allows the SCC-AS/ATCF to read the SR-VCC UE capability information received from MME.

2.31	Wildcard Public Service Identifiers (PSIs) Support	The HSS supports the use of wildcarded Public Service Identities (PSIs) in IMS networks. A wildcarded PSI is a PSI that represents a collection of PSIs that matches a regular expression.
2.32	CS/PS/EPS User Data Access	This feature allows an AS to request location or user state data regarding Circuit Switch (CS), Packet Switch (PS), or Evolved Packet Switch (EPS) domains from the HSS, as well as the Reference Access Location (RAL) in wireline defined as the main point of access of the subscriber from a fixed type of access.
2.33	GAA/GBA Support	The HSS implements the Zh interface and procedures for GAA/GBA support as defined in 3GPP TS 29.109 Generic Authentication Architecture. This interface allows a Bootstrapping Server Functionality (BSF) in the network to retrieve authentication vectors from the HSS/AVG function, or HLR/AuC entity to be used for user authentication. Once authenticated, the user can be granted with access to the services provided by different Application Servers (ASs) in the network.
2.34	Access Control	The feature enables operators to allow or restrict the access of Sh, Zh, and SLh operations to the user data. This feature allows the restriction of the access of the following: - AS to the user data through the Sh interface. - BSF use of Zh interface. - GMLC use of SLh interface.
2.35	SLh Support	The HSS implements the SLh interface, which provides the means to support mobile location services for operators, subscribers, and third party service providers.
2.36	IMSI Change-Over Support in ESM	The HSS supports IMSI Change-Over procedures allowing the change of a USIM card for a subscription, while retaining all the existing EPC subscription information. When authenticating by HLR/AuC, both immediate and deferred modes are supported.
2.37	IMSI Change-Over Support in IMS	The HSS-FE shall supports IMSI Change-Over procedures allowing the change of a USIM/ISIM card for a subscription, while retaining existing IMS subscription information.
2.38	Application Data Repository	The HSS-FE application shall have Application Data Repository feature to allow the ASs to store, update, and delete transparent data through the Sh interface. The transparent data is data not understood by the HSS, but that an AS stores in the HSS to support its service logic.
2.39	IMS User Data Access	The HSS shall support the procedures used by the Application Servers to access IMS user-related data, called non-transparent data.
2.40	Notification Efficiency	The HSS shall have function provides to the Application Servers (ASs) and the HSS with the ability to combine several data in both the request and the answer, to optimize the amount of exchanged message. The HSS supports to retrieve several data reference in a single Sh-Pull procedure. The HSS also supports to subscribe or unsubscribe to multiple data reference, or multiple service indication or both in a single Sh-Subs-Notif procedure.
2.41	Implicit EPC Subscription	The HSS shall have function to support EPC subscriptions automatically created in traffic time, without explicit provisioning procedures, based on existing subscriptions in HLR/AuC.

2.42	Digest Authentication of XCAP users	The HSS shall have function to provide user authentication support for XML Configuration Access Protocol (XCAP) to aggregation proxy.
2.43	Implicit Registration Support	The HSS application shall have Implicit Registration functionality which allows a user to register and deregister a set of public user identities by specifying only one of such identities. For example, a set of SIP URIs and TEL URIs associated with the same user can be registered with a single REGISTER message.
2.44	TADS Support in ESM	The HSS shall have the function to provide SCC-AS with Terminating Access Domain Selection (TADS) information, which is used by SCC-AS to handle terminating sessions directed to an end-user.
2.45	TADS Support in SDA	The HSS application can query MME about TADS information to be provided to SCC-AS over Sh interface
2.46	SMS over IP	The HSS shall have the function to provide the functionality of Short Messages (SMS) over IP access networks expanding the cooperation between 2G/3G and other networks with IP access, such as LTE network with support of SMS.
2.47	Multiple Subscription Support for Mobile Broadband	The HSS shall have function to allow multiple subscriptions in Evolved Packet System (EPS) to share one common MSISDN. This common MSISDN is extendedly used by the network for charging purposes, though not limited to charging.
2.48	Access Awareness for Fixed Mobile Convergence (FMC)	The HSS application shall be able to identify a user or subscriber type of access to execute certain services in order to support Identity Convergence. This information is based on the presence and execution of the PANI header in the SIP messages. The HSS receives the user access information from CSCF and applies the roaming restrictions that correspond in each case
2.49	Control of Maximum Number of Contacts per Public Identity	The HSS shall have feature to allow the HSS to define a Maximum Number of Contacts (MnoC) to be registered per IMPU.
2.50	Identity Convergence	The HSS application shall support the data model which allows the association of more than one IMPI to one IMPU.
2.51	Loose Routing Support in ISM	The HSS shall support a loose routing indication which can be provisioned in the HSS, to be provided by the S-CSCF, indicating that a loose-route mechanism is to be applied to the public identities contained in the user profile received from the HSS.
2.52	Authentication Method Selection based on Line Profiles for Wireline Access in IMS	The HSS is capable of selecting the authentication mechanism to be used for a DSL wireline user based on the Line Profiles provisioned in the HSS.
2.53	P-CSCF restoration.	The feature P-CSCF Restoration Procedures enhances the robustness of the IMS network and ensures better user experience during potential system failures occurred in the P-CSCF. The P-CSCF restoration functionality provides a quicker mechanism for the UE to regain services by triggering a UE initial registration on a per-user per-terminating-request basis. The UE session requests are served by a new P-CSCF, or the same P-CSCF (when returned into service).

		When the S-CSCF receives a terminating request destined for a UE (served by an unreachable P-CSCF), or the P-CSCF returns an error code; the S-CSCF sends a P-CSCF restoration indication to the HSS. The HSS updates the registration status of the IMPU-IMPI pair, removes the stored S-CSCF restoration information, forwards the restoration request to the MME where the user is located. Then, the MME propagates it to the UE to perform a new IMS initial registration towards a reachable P-CSCF.
2.54	S-CSCF restoration	The HSS supports S-CSCF Restoration Procedures in alignment with 3GPP specifications. A set of standardized procedures for automatic restoration after loss or corruption of data, caused by failure or restart of an S-CSCF, reduces the impact of S-CSCF failures to maintain high availability of the IMS service to the users. In this context, S-CSCF uses the HSS as a backup repository to store session-related information, so the session can be recovered after a failure. The HSS receives S-CSCF restoration information and stores that information per IMPI-IMPU pair or IMPI-IRS pair at registration time. In addition to the standard restoration procedures and to facilitate fallback, the HSS allows the change of the S-CSCF name upon registration or terminating call from a different S-CSCF, even if no authentication request is received.
2.55	NB-IoT Support	The proposed HSS-FE shall support Nb-IoT (IRAT Type Nb-IoT).
2.56	Non-IP PDN Type APN (for IoT devices)	The proposed HSS-FE shall support Non-IP PDN Type APN (for IoT devices) feature.
2.57	MDT User Consent Management	The proposed HSS-FE supports the MDT-User-Consent AVP information as part of the EPS subscription data. Minimization of Drive Test (MDT) is a new type of trace where the UE is involved. This way, MDT is supported by the UE (MDT capability) and also requires user consent to be applied. This feature allows automated drive test.
2.58	EPC QoS to Create Subscriber Categories	The proposed HSS-FE shall support the feature which adds extra flexibility to steer user traffic in terms of Quality of Service (QoS). With this feature, Operators are able to assign different network quality to different subscriptions. This is achieved by sending the Pre-emption-Capability Attribute Value Pair (AVP) and the Pre-emption-Vulnerability AVP inside the QoS profile per service context. By using the combination two AVPs, the HSS specifies to the MME the resources to be assigned to a specific user, as required by local operator policies. HSS allows the definition of pre-emption information (pre-emption capability and pre-emption vulnerability) inside the QoS profile per service context, which is used to allow the EPS user to access a given service with allowed capabilities.
2.59	Subscribed Periodic RAU/TAU Timer Support	The proposed HSS-FE shall support the function which manages a periodic RAU/TAU timer as defined in 3GPP specifications. This function allows the operator to provide an individual RAU/TAU timer or configured RAU/TAU timer in the EPC user profile. If both RAU/TAU timers are provided, the individual value is used instead of the EPC configured data.
2.60	Monitoring Events Support	The proposed HSS-FE shall support the function which allows configuration and deletion of configuration of different monitoring events for a given UE/MTC device from one or several SCEF IDs. The events are configured for a single UE through the HSS in the MME, using either the MSISDN or

		external identifier as an identifier of the user or device. This function allows the support of S6t interface towards SCEF function.
2.61	Non-IP Data Delivery Support	The proposed HSS-FE shall support the function which is able to authorize, update, and revoke procedures for Non-IP Data Delivery on a per MTC/APN basis in an S6t NIR command, using either the MSISDN or the external identifier as an identifier of the user. Through the capability of Non-IP Data Delivery Support function, the HSS provides MTC provider authorization for the UE in case MTC provider information is received in the NIDD information request.
2.62	Device Triggering Support	The proposed HSS-FE supports Device Triggering function. With this function, the HSS is able to authorize a specific Service Capability Server (SCS) to request the Device Trigger service using the S6m SIR command, with either the MSISDN or the external identifier as the identifier of the MTC user.
3.	Centralized User Database (BE)	
3.1	Structured, Flexible and Extensible Data Model	This feature provides the following functionalities: - Store 2G, 3G and 4G subscription and policy information using an LDAP Directory Information Tree (DIT) or equivalent as the application data model. - Subscriber data for multiple applications or network elements is supported simultaneously. - Supports the 2G/3G (HLR-FE), 4G, 5G and IMS (HSS-FE), AuC, Service-Aware Policy Controller (SAPC/PCRF), Machine-to-Machine (M2M), Mobile Number Portability (MNP), Equipment Identity Register (EIR-FE), Internet of Things (IoT), E.164 Number Mapping (ENUM) and Authentication, Authorization and Accounting (AAA) profiles. - The structured data model is flexible and extensible. - Supports multiple identifiers per subscriber. - supports the use of External Identities for 4G Monitoring/5G Event Exposure services and other functions like location services.
3.2	Access Control	Access Control policies for LDAP, provisioning, and traffic can be dynamically configured through the definition of users and their associated set of data access privileges.
3.3	SOAP Notifications	BE-database supports outbound notifications. When data are modified, BE can send Simple Object Access Protocol (SOAP) based notifications towards a configurable destination endpoint .
3.4	Enhanced Overload Protection and Cooperative Load Regulation	The BE instances incorporate self-protection mechanisms and internal load regulation between its components, so that excessive incoming traffic (overload) does not lead to service interruption. BE instances support HLR/UDC system Cooperative Load Regulation FE-BE as well, which provides automated traffic throttling in the overloaded EPC system. This is implemented in both the application FEs and BE, and it is triggered by the application FE when BE is facing difficulties to handle the incoming traffic.
3.5	Data Export	Supports large-scale export operations of selected subsets of 2G/3G/4G data.
3.6	Data Consolidation	This feature provides following capabilities: - Consolidated and structured data model, supporting different combinations of subscription profiles representing the different network function resources. - Data Model supports common data shared among many users (also called profiles) that provides optimization of memory footprint. - Data Model optimized for real-time data access. - The extension of the data model can be carried out without impacting other applications

3.7	Security interfaces	This feature supports the following interfaces over a secure protocol: • Uu is secured through LDAPS • SOAP notifications are secured through SOAPS. • Access to the OAM CLI is secured through SSH. • The NETCONF OAM interface is secured through TLS. • Backups are exported through SFTP. • Application counter XML files are available through Secure File Transfer Protocol (SFTP).
3.8	Backup And Restore	A backup of the whole system data can be ordered and executed without stopping traffic. During backup, traffic and provisioning are allowed. Execution of data or configuration backups can be scheduled. Restore from backup shall be supported.
3.9	Replica Consistency Check	The Consistency Check function looks for divergences in data stored in BE instances and makes it possible to manually correct them.
3.10	Access to User Data Repository Data	The Access to User Data Repository Data function offers read/write access to data stored in the User Data Repository in BE Uu (LDAP) interface. In addition, a REST-based interface access shall also be supported for 5G evolution.
3.11	OAM and Usability	The BE supports specific software functions for Fault Management (FM), Configuration Management (CM), and Performance Management (PM), exposing a single Northbound Interface to any OSS/BSS external platforms.
3.12	Logging Support	Logging support enables the BE to record information that can be useful for troubleshooting purposes.
3.13	Security Management	The BE shall support the following security domains: • Provisioning Security Domain • Operation, Administration, and Maintenance (OAM) Security Domain • Signaling Security Domain
3.14	Application Facilitator	Back-end DB shall support the use of Binary Large Objects (BLOB) or equivalent where an application can store any transparent data in the data model (i.e for IMS/VoLTE subscribers). The BLOB can be stored in memory or on disk/storage solution.
4.	Services Provisioning	
4.1	Data integrity assurance	The data integrity feature ensures data provisioned is consistent and accurate.
4.2	Error handling	The error handling feature can reduce BSS/OSS impact should an error occur by implementing connectivity at various layers and enable loose error handling capability.
4.3	Transaction management	This feature provide a robust transaction management engine to handle common functions in the system that enables uniform execution, monitoring, tracing, and logging of provisioning requests regardless of its complexity and granularity. It provides tractability for trouble shooting. It also handles rollback, retry and fault tolerance.
4.4	Graphical resource configuration engine	This feature provide a graphical environment to allow configuration service logics based on available provisioning logics. It also gives operators a better visibility of the activities carried out by provisioning system.
4.5	Bulk provisioning and Batch Handler	The bulk provisioning capability can provision large number of subscribers. It can pre-provision pre-paid SIM cards in the network, such provisioning activity generates high provisioning traffic in bursts. The Service Order Batch Handler executes bulk provisioning tasks directly. It

		also reduces the capacity requirement on the BSS as well as the backbone network.
4.6	High Performance Platform	The provisioning system is designed with high performance throughout. The throughput reflects the provisioning capability of the orders received from upstream systems.
4.7	Support 2G 3G provisioning	This feature provides support for MML/CAI/CAI3G interfaces of HLR-FE, AUC-FE and MNP-FE provisioning, also sharing of HLR network infrastructure among different regions.
4.8	Provisioning of IMS Core	This feature provides activation interfaces for provisioning of IMS subscriber data in the data layered architecture through CAI3G interface. IMS feature provides method for administration of IMS subscriber data in Back-end DB. This feature also includes provisioning of ENUM.
4.9	Provisioning Support for 4G Services (LTE)	This feature provides activation interfaces for provisioning of 4G services in data layered architecture. The provisioning interfaces are CAI3G and CLI. LTE/SAE (4G) feature provides method for administration of EPC subscriber data in Back-end DB.
4.10	Wifi-calling (Non-sim)	The vendor Provisioning system shall support the function which provides Off-the-shelf support for Voice over Wi-Fi subscribers provisioning, (in the solution that including the nodes HSS, ECAS, and IPWorks AAA (NDS)), for non-SIM based devices.
4.11	Advanced Activation	Provisioning system provides Performance Monitor which is an instant view of system performance, with a dashboard overview and detailed view showing throughput and response times. System administrators can view all relevant performance data in the dashboard at a glance. Performance Monitor shows the incoming requests as northbound and outgoing requests as southbound. The Dashboard feature supports visualization for up to 7 days of Provisioning.
4.12	PRBT & CNAP provisioning support	Provisioning system shall support provision for PRBT & CNAP services. In particular, following parameters shall be supported: MOPRBT, CNAP and SOCNAP.
4.13	Provisioning Orchestration	The proposed provisioning system shall support routing towards multiple back-end databases in the same HLR/UDC system.
4.14	Massive IoT support	The proposed provisioning system shall support Massive IoT devices, using Nb-IOT or CAT-M1 access.
4.15	Monitoring event supports	Provisioning system provides the possibility to expose UE/user data, by enabling monitoring events support. Through this function, configuration and deletion is enabled for configuration of different monitoring events for a given UE/MTC device from one or several SCEFs. The events are configured for a single UE through the HSS in the MME, using either the MSISDN or external identifier as an identifier of the user/device.
4.16	Non-IP Data Delivery (NIDD) Support	The proposed provisioning system shall have function which enables the authorization for Non-IP data delivery, as well as the handling of devices using PSM. This function is especially useful for operators providing exposure support for IoT application servers. Through this function in Provisioning system, HSS is able to authorize, update and revoke procedures for Non-IP Data Delivery on a per MTC AS/APN basis by means of S6t NIR, using either the MSISDN or external identifier as an identifier of the user. HSS provides, as part of the answer, the other related identities for that user, that is, IMSI, external identifier and/or MSISDN, whenever available.

4.17	Device Triggering Support.	Provisioning system provides the Device Triggering support. With this function, HSS is able to authorize a specific Service Capability Server (SCS) to request the service using the S6m SIR command, with either the MSISDN, IMSI or external identifier as the identifier of the MTC user.
5.	Other features	
5.1	Mobile Terminating Roaming Forwarding (MTRF) support	The HLR Application shall support Mobile Terminating Roaming Forwarding (MTRF) feature.
5.2	VoLTE supplementary services synchronization	The HLR Application should have the feature to support Supplementary Service synchronization for Self-provisioning updates in CS (through 24.010 procedures) which will be replicated into MMTel subscriber's profile.
5.3	SMS over IP	The HLR Application shall support SMS over IP function. The vendor HLR shall support SMS over IP indicator in subscriber profile.
5.4	IMS Centralized Services (ICS) indicator support	The HLR Application shall support ICS indicator function. The vendor HLR shall support IMS Centralized Services (ICS) indicator in subscriber profile.
5.5	Mobility Related Triggers in HLR	The HLR Application shall provide functionality for the SCF to be informed of subscriber mobility related events taking place in the MSC/VLR. Location updating and IMSI detach mobility related events are indicated to the SCF. A new subscription information element should be introduced in the HLR to support this mobility related trigger.
5.6	Spatial Triggers Support in HLR	Spatial Triggers mechanism allows the Location Services (LCS) Client to be informed of the location of the subscriber making a location updating, call, SMS or SS procedure taking place in the MSC. This feature provides support in HLR to hold subscriber data indicating whether or not the user subscribes to spatial triggers, and also hold a GMPC address per subscriber. Spatial Triggers applies to the circuit switched (CS) domain.
5.7	Weighted Load Balancing Towards Back-End Nodes	The vendor HLR/AuC-FE shall have the functionality to support the weighted load balancing towards its back-end nodes.
5.8	HGSDP ENHANCEMENT FOR ONE.VIP	The HLR Application shall allow to retrieve subscriber data with an option to return the actual Location and State of the subscriber. When the option is used, the HLR will request the actual Location and State of the subscriber by sending a MAP_PROVIDE_SUBSCRIBER_INFORMATION to the VLR only when subscriber location is KNOWN in HLR. In all other cases SUBSTATE parameter of location will be obtain from HLR only.
5.9	A-NUM BASED PRBT	The HLR Application shall support The Mobile Originating Personalized Ring Back Tone (MO-PRBT) service allows a mobile subscriber to hear its own defined PRBT when establishing a call to other subscriber.
5.10	CALLING NAME	The HLR Application shall support The Calling Name Presentation (CNAP) supplementary service enables the called party to receive the calling name

	PRESENTATION (CNAP)	information of the calling party. This supplementary service provides the ability to indicate the name information of the calling party to the called party at call set-up time for all incoming calls.
5.11	TYPE DEPENDANT DEFAULT CALL FORWARDING	The HLR Application shall support Default Call Forwarding; can be used for both Missed Call Alert and Voice Mail System (CFD on Not Reachable -> MCA, CFD on Busy + CFD on No Reply -> VMS)
5.12	ROUTING OF USSD MESSAGES TO EXTERNAL NODE BASED ON 4 DIGIT SERVICE CODE	The HLR Application shall support up to 4 digits service code
5.13	CHANGE SSN NUMBER FOR EXTERNAL USSD NODE	The HLR Application shall support using SSN=147 to External USSD Server
5.14	INCREASE OF ENAPS FROM 63 TO 127	The HLR Application shall support maximum 128 USSD External Node Address
5.15	ACTIVATION OF VOICE MAIL SYSTEM FUNCTION IN MSS	The HLR Application shall support to integrate with VNPT MCA Server using SendRoutingInfoForSM with SPC+SSN+GT and Routing Indication = GT in Calling Party Address
5.16	Multi-sim	The proposed solution shall provide multi-sim feature which supports Parallel ringing between Primary device and Companion device in MT call (simultaneously ringing).
5.17	3G.324M Multimedia support in HLR	The feature provides support for sending and receiving circuit-switched multimedia for both WCDMA and GSM. Circuit-switched multimedia is based on the 3G.324M standard, which is a 3G-variant of H.324, an ITU-T recommendation for low bit-rate multimedia communication.
5.18	7-Digit Dialing (Forwarded-to Number Registration)	The feature applies in the case when HLR receives a 7 digit forwarded-to number in the Register SS message and the nature of address of the forwarded-to number is "unknown". The HLR performs certain checks before inserting 1+NPA in front of the number.
5.19	Administration of Zonecodes	A ZoneCode, defined in GSM phase 2 MAP, identify an area where service may or may not be obtained. The area information is transferred in the Insert & Delete subscriber data. HLR stores a list of areas per subscriber in the form of ZoneCodes. A maximum of 10 ZoneCodes for upto 10 PLMNs are supported. Only the list of ZoneCodes applicable for the subscriber and the visited PLMN is sent to the MSC/VLR at Location Update attempt.
5.20	Anonymous Call Rejection (ACR) in HLR	Anonymous Call Rejection (ACR) is a subscriber service which automatically rejects all incoming calls when the presentation of calling party

		number is restricted by the calling party. This feature is applicable to CS (Circuit Switched) subscribers.
5.21	Basic Call Handling in HLR	This features provides the GMSC with routing information or forwarding information for incoming telephony calls. The HLR will do the necessary checking such as verification of subscription, status of call barring services, status of relevant call forwarding services etc.. Depending on the checking, the HLR either sends a request about roaming number to the VLR or an error code to the GMSC. The error codes include reasons like: unknown subscriber, call barred, forwarding violation or absent subscriber. Finally the Mobile Station Roaming Number, MSRN, the call forwarding information or the error code is sent to GMSC. The HLR will be able to handle: -Mobile Terminated calls, including Bearer Capabilities -Additional MSISDN -Supplementary Services per Basic Service Group (described in feature 38.3)
5.22	Basic Mobility Handling in HLR	The HLR keeps track of the Mobile Subscribers in the network. This allows the subscribers to be reached wherever they are in the entire GSM service area.
5.23	Basic Subscription Handling	The feature provides syntax and consistency checks for subscription data provisioning commands in HLR Front End.
5.24	Call Barring Services in HLR	The purpose of this feature is to provide means to a Operator or a mobile subscriber, who holds a subscription in HLR, to bar calls. The calls can be barred in the following situations: Call Barring of all outgoing calls. Call Barring of outgoing international calls. Call Barring of outgoing international calls except those directed to the home PLMN country Call Barring of all incoming calls. Call Barring of incoming calls when roaming outside the home PLMN country.
5.25	Call Forwarding Services in HLR	The purpose of this feature is to provide means for the service provider or a mobile subscriber, who holds a subscription in HLR, to forward incoming calls to another directory number. The call can be forwarded in the following situations: Call forwarding on MS not reachable Call forwarding on MS busy Call forwarding on no reply Call forwarding unconditional
5.26	Call Waiting and Call Hold subscription	The purpose of the Feature is to provide: Call Waiting, i.e the mobile subscriber is notified about an incoming call, whilst he is busy with an other ongoing call. The subscriber has the possibility to accept, reject or ignore the incoming call. Call Hold, i.e to interrupt speech traffic on an ongoing call, or to make a call whilst he is busy with an other ongoing call. The subscriber has the possibility to re-establish the communication.
5.27	CAMEL Any Time Modification (ATM) in HLR	With this feature HLR-FE offers a MAP interface to gsmSCF (i.e. CSE) so that any Operator Specific Service (OSS) which service logic is located in the gsmSCF can make a request for modification of subscription data.

5.28	CAMEL Any Time Subscription Interrogation (ATSI) in HLR	With this feature HLR-FE offers a MAP interface to gsmSCF (i.e. CSE) so that any Operator Specific Service (OSS) which service logic is located in the gsmSCF can make a request for retrieval information about data of subscription. This interface can be used to read certain subscription data in the Core Network from the IN domain.
5.29	CAMEL Notify Subscriber Data Change (NSDC) in HLR	With this feature HLR offers a MAP interface to gsmSCF (i.e. CSE) so that any Operator Specific Service (OSS) which service logic is located in the gsmSCF can be informed about certain subscription data modification. This interface can be used to notify the IN domain of subscription data changes.
5.30	Camel Support for CS Call Control	This feature comprises the following CAMEL Subscription Information (CSI) elements up to CAMEL implementation phase 4, as standardized by 3GPP: Originating CAMEL Subscription Information (O-CSI) Terminating CAMEL Subscription Information (T-CSI) VMSC Terminating CAMEL Subscription Information (VT-CSI) Translation information Flag CAMEL Subscription Information (TIF-CSI)
5.31	CAMEL Support in HLR for Conditional Triggering Criteria	This feature comprises the following elements up to CAMEL implementation phase 4, as standardized by 3GPP: Terminating Basic Call State Model Detection Point Criteria (T-BCSM-DP Criteria) Originating Basic Call State Model Detection Point Criteria (O-BCSM-DP Criteria)
5.32	CAMEL Support in HLR for CS Mobility Management	This feature comprises the following CAMEL Subscription Information (CSI) element from CAMEL implementation phase 3, as standardized by 3GPP: Mobility Management event Notification CAMEL Subscription Information (M-CSI) This CAMEL feature allows HPLMN to instruct the VPLMN to interact with a gsmSCF, at subscriber mobility events, such as (Not-) reachability and roaming, for operator specific services invocation.
5.33	CAMEL Support in HLR for GPRS interworking	The feature addresses in particular the need for information exchange between the Home PLMN and the Visitor PLMN when a HPLMN specific service shall be provided to a subscriber roaming outside the HPLMN. The operator-specific services are implemented using Intelligent Network (IN) principles, whereby the CAMEL network feature provides the mechanisms necessary for integrating GSM/UMTS and IN functional entities, including support for roaming. The feature supports part of the functionality of CAMEL phase 3 (GPRS-CSI).
5.34	CAMEL Support in HLR for MO-SMS	The operator-specific services are implemented using Intelligent Network (IN) principles, whereby the CAMEL network feature provides the mechanisms necessary for integrating GSM/UMTS and IN functional entities, including support for roaming. The feature supports part of functionality of CAMEL phase 3 (SMS-CSI).
5.35	Closed User Group in HLR	This feature is used to assign the CUG supplementary service together with associated data, which is stored per subscriber in the HLR. The HLR updates the VLR with CUG subscription data.
5.36	Collect Call Dialling	The Collect Call Dialling Automatic (CCDA) makes it possible for mobile subscribers to perform a call charged on the called subscriber automatically using

	Automatic (CCDA)	announcement machines without any intervention of an auxiliary operator.
5.37	Common Channel Signalling System No. 7, ITU Type	This feature provides a standardized general purpose No.7 Common Channel Signaling System that meets all requirements for call control signaling applications.
5.38	Cooperative Load Regulation FE-BE	The "Cooperative Load Regulation FE-BE" feature is a mechanism that provides an automated throttling of traffic in the UDC system and that is implemented in both the application Front End (i.e. HLR-FE) and the BE. This mechanism is triggered when the BE faces difficulties to handle all incoming traffic. The feature provides a graceful mechanism that copes with congestions on a given BE node via cooperative actions between the congested node and the HLR-FE preventing that the complete UDC system be critically impacted on a single BE node overload situation.
5.39	Default Call Forwarding	The purpose with this feature is to simplify the call forwarding mechanism to e.g. the voice mail system. The Default Call Forwarding is provided per Basic Service Group (except SMS) meaning that the feature also can be used with different forwarded-to numbers for e.g. terminating Fax calls and speech..
5.40	Explicit Call Transfer in HLR	Explicit Call Transfer (ECT) enables a mobile subscriber who has two calls, each of which can be an outgoing or an incoming call, to connect the other parties in the two calls and release the served mobile subscribers own connection.
5.41	Extended CAMEL Support	This feature is an extension to the CAMEL standard, providing the capability to invoke CS1 and CS1+ based services in a CAMEL network architecture. This feature thus allows, in a standardized manner, the use of existing high functional IN capabilities (based on CS1/CS1+) available today, whilst the end-user is within the HPLMN.
5.42	Evolution of HLR-Monolithic application to HLR-FE	This feature describes the network enhancements achieved with the evolution from monolithic HLR/AUC/FNR to the HLR-FE in User Data Consolidation (UDC) solution which is composed by the Centralized Back-end User Data Base, the Provisioning Gateway (PG) and the HLR Front Ends.
5.43	GPRS Support in HLR	This feature introduces in the HLR the subscriber's data storage and mobility management capabilities essential to provide the General Packet Radio Service (GPRS) in a GSM/WCDMA network.
5.44	GSM Authentication Data Handling	This Feature handles the administration of authentication data for all mobile subscribers in HLR.
5.45	High Speed Downlink Packet Access (HSDPA) in HLR	This feature allows HLR to support the radio technology available for UTRAN P4 called HSDPA
5.46	High Speed Uplink Packet Access (HSUPA) in HLR	This feature allows HLR to support the radio technology available for UTRAN P4 called HSUPA
5.47	Immediate Call Itemisation subscription	The Immediate Call Itemization (ICI) supplementary service enables fast output of charging data from the MSC. This feature makes it possible for the HLR to handle Immediate Call Itemization (ICI) subscriptions.

5.48	Immediate Service Termination (IST) in HLR	This feature offers Non-CAMEL based Immediate Service Termination which provides the HPLMN operator with effective means to supervise and disconnect, if necessary, call activities of its roaming subscribers that have been identified as being fraudulent (long duration calls are an indicator of possible call selling/fraud activities).
5.49	IMSI Changeover	This feature provides the GSM operators and Mobile Subscribers (MS) means to replace SIM-card in a flexible way, when for instance the card is lost, malfunctioning or just periodically changed to prevent fraud or malfunctioning. Both cards will be valid over a certain period, as the operator may not know the exact change-over time. Once the new card is used for the first time or a data limit threshold is reached, the old is barred.
5.50	Load Management	This feature support following network status and alarm information: -exchange availability, -processor and exchange input load status, -route availability, -route load status. -processor load control
5.51	Load Regulation in HLR	Load Regulation in HLR provides regulation mechanisms for handling situations caused by extensive signaling towards the HLR node. Typically, such situations may occur at busy hour traffic peaks or at abnormal situations such as sending of HLR Reset.
5.52	MAP based interface HLR-AUC	This Feature handles the fetching of authentication data from an external AUC connected through a variant of MAP interface.
5.53	Missed Call Alert	This subscriber service enables the called party to be informed about the missed call while being Busy or Not Reachable. A Short Message is sent automatically towards the called party informing that calling party had called her/him. The service is invoked if subscriber has not active any call forwarding.
5.54	Mobile Application Part (MAP)	Mobile Application Part (MAP) is a comprehensive signaling scheme that has been developed for GSM/UMTS networks. MAP provides necessary-signaling procedures required for information exchanges between HLR and MSC.
5.55	Mobile Subscriber priority level in Channel Allocation in HLR	The feature introduces a channel allocation priority level in HLR which can be set per subscriber. The priority level may take a value range of 1 to 15, where value 15 means priority level not used. However, as an alternative for certain subscribers, no value has to be set. With help of this feature the subscriber base may be segmented in different categories where different level of grade of service shall apply.
5.56	Operator Determined Barring (ODB) in HLR for Packet Oriented Services	The following Operator Determined Barring options are available with this feature: 1.Barring of all Packet Oriented Services 2.Barring of Packet Oriented Services provided by Access Points within the Home Public Land Mobile Network (HPLMN) while the subscriber is roaming in a Visited Public Land Mobile Network (VPLMN) 3.Barring of Packet Oriented Services provided by Access Points within the roamed to VPLMN
5.57	Operator Determined Barring in HLR	The Operator Determined Barring refers to the administrative means used by the operator in order to bar the Mobile stations (MS) from outgoing and/or incoming calls for administrative reasons.
5.58	Operator Determined	The following Operator Determined Barring options are available with this feature:

	Barring in HLR for call forwarded-to number	1.Barring of registration of any call forwarded-to number. 2.Barring of any international call forwarded-to number. 3.Barring of registration of any international call forwarded-to number except to a number within the HPLMN country. 4.Barring of registration of inter-zonal call forwarded-to number. 5.Barring of registration of inter-zonal call forwarded-to number except to a number within the HPLMN country.
5.59	Optimal Routing for Late Call Forwarding	Support of Optimal Routing at Late Call Forwarding is a network feature which enables calls directed to a mobile subscriber to be routed directly from GMSC to the mobile subscriber's forwarded-to destination when Late Call forwarding condition is met at the visited MSC/VLR.
5.60	Retrieve Information to SCP from HLR and MSC/VLR in HLR (SDF)	This feature allows the SCP to interrogate the following data of a particular mobile subscriber: Subscriber Status. It indicates the status of the mobile subscriber. It can have one of the following values: Idle, Busy or Not Reachable. The provision of this item is independent of the Location Information provision. Location information. It indicates the location of the served subscriber. The provision of this item is independent of the MS status provision. When location information cannot be provided with full certainty, the latest location information, if available, is provided together with an indication that the location information is not reliable.
5.61	Short Message Services in HLR	The Short Message Service (SMS) allows sending and receiving alphanumeric messages from and to mobile stations. The short messages pass through a Short Message Service Centre (SMS-SC) where they can also be stored and forwarded in the SMS-SC when necessary.
5.62	Signalling Transport over IP (SIGTRAN) in HLR	This feature makes it possible to transport Signaling System No.7 (SS7) user part signaling (MAP, INAP) over an IP bearer.
5.63	SMS over GPRS in HLR	The feature provides a subscriber with the possibility to send and receive Mobile Terminated and Mobile Originated Short Message Services (SMS) over the General Packet Radio Service (GPRS) in a GSM network.
5.64	SS7 Performance Management	The Feature Statistics and Traffic Measurement for SS7 network provides the operator staff with more detailed statistics on the signaling system network.
5.65	SS7 Supervision	The Feature Event Reporting and Disturbance Supervision gives the operator the possibility to control the signaling network.
5.66	Support of Mobile Traffic Recording	Tracing a subscriber (identified by a specific IMSI) in the HPLMN can be activated and deactivated by command in the HLR. The request is forwarded to the MSC where the subscriber is registered. The MSC monitors the subscriber and invokes a trace when a trace event occurs.
5.67	Support of Multiple Numbering Scheme	With this feature, it is possible to use the multiple numbering scheme principle in GSM 900/1800 HLR by defining additional MSISDNs (with the corresponding GSM Bearer Capability) for a subscriber.
5.68	Support of Personalized Ring Back Tones (PRBT) in HLR	The Personalized Ring-Back Tone (PRBT) feature enables a mobile subscriber to choose music or other sound file to be played towards the calling party instead of the usual ring back tone when he/she is called.
5.69	Unstructured SS Data	This feature provides a transparent transfer in HLR of USSD between an MS and switching system external nodes like a message centre and/or an SCP.

	(USSD) to External Node	
5.70	Unstructured SS Data (USSD) Transparent Transfer to gsmSCF	This feature provides a transparent transfer in HLR of USSD between an MS and a GSM Service Control Function (gsmSCF) node. The subscriber will be able, by using USSD towards a gsmSCF node, to: -Interrogate data for a specific CAMEL service or CAMEL subscription data profile. -Register/Erase/Activate/Deactivate subscription to CAMEL services or profiles.
5.71	Unstructured SS data in HLR	USSD (Unstructured Supplementary Service Data) enables a mobile user to invoke and control supplementary services, that are: - not supported by the mobile user's mobile equipment, i.e the needed functionality (e.g. signaling) is not implemented in the mobile. - non-GSM supplementary services for which no functional signaling is defined.
5.72	WCDMA authentication and data handling	This feature provides the basic capabilities for the Home Location Register (HLR) to support the standardized WCDMA and LTE security functions: - subscriber identity authentication - network authentication - signaling and user data confidentiality - Signaling data integrity.
5.73	Home Network Dialing while Roaming (D-CSI, CAMEL Ph3) in HLR	This feature comprises the following CAMEL Subscription Information (CSI) element for CAMEL implementation phase 3, as standardised by 3GPP: Dialed Services CAMEL Subscription Information (D-CSI). This CAMEL feature allows HPLMN to instruct the VPLMN or IPLMN to interact with a gsmSCF, which is controlled by the HPLMN, at call handling for operator specific services invocation on subscriber dialed number basis. This CAMEL feature is applicable to all circuit switched Basic Services without distinction (except Emergency calls).
5.74	Home Network Initiated Calls (gsmSCF initiated calls, CAMEL Ph4) in HLR	This feature allows mobile terminating call set-up handling in HLR for HPLMN network-initiated or gsmSCF-initiated calls.
5.75	Home Network Services and Control for MT-SMS (MT-SMS CSI, CAMEL Ph4) in HLR	The feature allows HPLMN to instruct the VPLMN to interact with a gsmSCF, which is controlled by the HPLMN, at Mobile Terminating Short Message delivery handling.
5.76	Multiple Subscription Support in HLR	Multiple Subscription Support is an HLR-FE feature that gives the operator the possibility to link together up to ten different subscriptions in the HLR-FE. One of the linked subscriptions is identified as "active subscription", and all terminating calls and SMSs directed to any of the linked subscriptions are automatically directed towards this subscription. One of the linked subscriptions is identified as "master subscription". The operator is able to select, and change, the master subscription. It is possible, as an operator option, to choose the MSISDN tied to the master subscription as the number to be presented to the B-subscriber whenever a call is established from any of the linked subscriptions.

5.77	Access to Mobile IN Services in HLR	This feature provides means to a mobile subscriber, who holds a subscription in HLR, to use Intelligent Network services, i.e., enables to route and handle originating and terminating IN specific calls in a flexible and efficient way. This is obtained by assigning the mobile subscriber a new, extended IN data in HLR, both for the originating and terminating calls. OIN: Originating IN, used for mobile originated or forwarded calls. OICK: Originating IN Category Key, used for mobile originated or forwarded calls. TIN: Terminating IN, used for mobile terminated calls. TICK: Terminating IN Category Key, used for mobile terminated calls.
5.78	Automatic Device Detection Support (ADD) in HLR	The feature ADD in HLR provides a mechanism to detect when a user's mobile terminal needs to be configured and to supply the needed configuration data. The decision of sending configuration data is taken by the HLR when the end user changes the terminal and when there is a relevant change in the user's subscription data.
5.79	SMS Home Routing	The feature SMS Home Routing is applicable on subscriber basis to all subscribers with access to circuit switched network and to all subscribers with access to packet switched network. The feature SMS Home Routing is based on the analysis of the Send Routing Information for Short Message (SRI_SM) MAP operation received in HLR FE on MAP level 1, 2 or 3. The aim is to offer a mechanism, referred as MT-SMS screening, that allows the operator to control all the MT-SMS for his subscribers, even when they are roaming outside the Home PLMN. Such a mechanism covers the following aspects: - The capacity to ban not desired SMS from reaching the User Equipment. - The capacity to route MT-SMS via an SMS-SC like logical entity, referred to as SMS Router, located in the HPLMN of the receiving UE.
5.80	Remote Control Equipment	This feature support Remote control equipment function, for LI system interworking.
5.81	Positioning in HLR for CS	The feature supports positioning requests initiated from the subscribers terminals, as well as positioning requests initiated by internal or external applications. Also, the feature provides HLR functionality, which makes it possible for subscribers to select whether or not they wish to be located.
5.82	Positioning in HLR for PS	Location Services on PS systems may be considered as a network provided technology consisting of standardized service capabilities that enable the provision of location applications. The subscribers are able to select whether or not they wish to be located, and through which applications. This information is stored in HLR as part of the subscriber record. For each subscriber, different privacy options can be stored specifying the classes of LCS clients (applications) for which positioning is allowed.
5.83	Any Time Interrogation in HLR	Any Time Interrogation in HLR provides the capability to receive the request of information for certain mobile subscriber for Circuit Switched (CS) domain and Packet Switched (PS) domain from gsmSCF or other nodes (e.g. HSS). The HLR provides the interface to request the information from the serving MSC/VLR for CS domain or from the serving SGSN for PS domain, and then forwards the received subscriber information to the requesting node.
5.84	SAE Mobility Management in HLR	The feature handles System Architecture Evolution (SAE) Mobility notification received in HLR-FE that occurs as a result of mobility management between 2G/3G and LTE networks.

		The purpose of this feature is to update the mobile subscriber GPRS location data in HLR-FE when mobility notification is received in HLR-FE.
5.85	HLR-HSS interworking for EPC support	The feature enables in HLR-FE handling of location information as a result of mobility management between 2G/3G and EPC networks. The purpose of this feature is to request cancellation of mobile subscriber GPRS location data in HLR-FE when mobility notification is received for a subscriber registered in EPC domain.
5.86	2G/3G Roaming Restriction in HLR	The feature 2G/3G Roaming Restriction in HLR. provides a standardized mechanism according to 3GPP to restrict subscriber access between GERAN and UTRAN.
5.87	Enhanced Multi-level Precedence and Pre-emption Service in HLR	The eMLPP service provides different levels of priority which are applied at call set-up and in the case of handover. The service provides a higher grade of service for urgent or emergency calls. It allows priority handling of calls, provision of priority information by the mobile user during call establishment, pre-emption of radio resources and called party pre-emption by high-priority calls. The feature supports mobile stations with or without support of the eMLPP service. Subscribers with mobile phones not supporting eMLPP, for example GSM Phase 2 mobile stations, can be assigned a default priority level.
5.88	Home controlled Optimal Routing at Late Call Forwarding	HPLMN controlled Optimal Routing at Late Call Forwarding is a network feature which enables calls directed to a mobile subscriber to be routed directly from GMSC to the mobile subscriber's forwarded-to destination when Late Call forwarding condition is met at the visited MSC/VLR. The advantage of this feature with regards to the 3GPP standardized feature Optimal Routing at Late Call Forwarding is that this feature does not require any support in the Visited PLMN.
5.89	Roaming Service Restrictions in HLR	This feature allows to restrict the access to certain services when subscriber is roaming into specific areas. The HLR does not send the services to the VLR, SGSN or GMSC if the subscriber is roaming in a VLR/SGSN belonging to the area where those services were restricted. It is possible to have different restricted services depending on the kind of subscriber. It is possible to restrict the roaming of certain subscribers in a specified area on node and subscriber level. It is possible to restrict the roaming depending on the kind of subscriber.
5.90	Logical HLR	This feature allows that one HLR node supports subscribers with different Home PLMNs where these different Home PLMNs can be either located in the same country or in different countries. 32 different Home PLMNs can be handled. This feature is applicable for Circuit Switched and Packet Switched domains.
5.91	Multi-Region Support in HLR	This functionality gives the service provider the ability to manage subscribers in different administrative domains called as "administration regions". The node is virtually split in a way that each administrative region can be managed independently on the node. All different administration regions must belong to the same Home PLMN. Up to 32 administration regions can be handled.
	SMS MT Adhoc Control in HLR	This functionality gives the service provider the ability to provide SMS MT service to customer whose ODB voice flag is blocked at HLR profile
6	Other features	
6.1	VoLTE supplementary services synchronization	The proposed solution should have the feature to support Supplementary Service synchronization for Self-provisioning updates in CS (through 24.010 procedures) which will be replicated into MMTel subscriber's profile and vice versa (IMS to CS domain). The VoLTE supplementary service sync solution should facilitate Automation of VoLTE Service Data Synchronization solution for a subscriber's Supplementary Service (SS) data for voice services between the

		HLR (Circuit Switched (CS) system) and the IMS (IP Multimedia Subsystem).
		VoLTE SS sync solution should be able to handle incoming notifications generated when a subscriber changes Supplementary Services in IMS domain or CS domain. The incoming notification is based SOAP (from back-end DB).
		The following user case shall be supported:
		- Self-provisioning updates in CS (through 24.010 procedures) to be replicated into MMTel subscriber profile when involving subscriber data pieces to keep synced in both domains
		- Self-provisioning updates in MMTel side, through Ut/XCAP procedures, to be replicated into 2G/3G CS telephony subscriber profile when involving subscriber data pieces to keep synced in both domains.

APPENDIX 2: TIME SCHEDULE

Time frame of contract execution

No	Content	T0	W1	W2	...	W20	W21	...	W...
1	Contract Signing	△							
2	Contract coming into force								
	Detailed Time schedule								
3	LC open								
4	For Foreign Part								
5	For Local Part								
6	Goods manufacturing and ex-works ready								
7	Shipping and Delivery of goods (arrive at VN custom)								
8	Custom Clearance								
9	Goods delivery to site								
10	Installation, commissioning, testing...								
11	ATP								
12	PAC								
13	(Network stabilization period)								
14	Final Acceptance Certificate (FAC)								

The Contract Execution Time: Three hundred sixty-five (365) days from the Contract Effective Date to the date of FAC (excluding warranty time).

(The contract implementation period meet with regulations specified in Section 1 of Chapter II – Bidding Data, Chapter V: Technical Requirements and Part 3 – Conditions of Contract and Contract Form)

Note:

The Bidder shall state clearly:

Work and Responsibility of the Bidder.

PART III
CONDITIONS OF CONTRACT AND CONTRACT FORM

Chapter VI. General Conditions of Contract

1. Definitions	For the purposes of this Contract, the following words and expressions shall have the meanings hereby assigned to them: 1.1. "Employer" is the non-person entity specified in SCC; 1.2. "Contract" means the Agreement entered into between the Employer and the Contractor, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein; 1.3. "Contractor" means the successful Contractor (maybe either Single Entity or Joint Venture Partner) and is specified in SCC; 1.4. "Subcontractor" means the Contractor on the List of Subcontractor that the Contractor participating in the procurement/bidding process recommends and that is subcontracted to perform the Related Services; 1.5. "Contract Documents" means the documents listed in the Contract Agreement, including any amendments thereto; 1.6. "Contract Price" means total amount charged for supply of the Goods and Related Services as specified in the Contract Agreement. The Contract Price must include all taxes, duties, levies, fees and charges (if any); 1.7. "Day" means day of the calendar year; "year" means the calendar year consisting of 365 days; 1.8. "Goods" covers machinery, equipment, raw or input material, fuels, spare parts or accessories; consumer goods; medical equipment available for use by health service providers; 1.9. "Related Services" includes services incidental to the supply of the Goods, such as installation, initial maintenance, repair, insurance thereof or other after-sales services, e.g. training, technology transfer, etc.; 1.10. "Completion" means the fulfillment of the Related Services by the Contractor in accordance with the terms and
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	conditions set forth in the Contract; 1.11. "Project Site (or Final Destination)" means the place named in SCC. 1.12. "Contract implementation period" is calculated from contract effective date until the parties have completed their obligations under the signed contract. 1.13. "GCC" means the General Conditions of Contract. 1.14. "SCC" means the Special Conditions of Contract. 1.15. "The Buyer" means..., who is authorized by the End-User to sign the Contract and arrange the import procedures, customs clearance of the equipment into Vietnam and other obligations as specified under this Contract. 1.16. "The Contractor" means the selected Bidder of the package "Engineering, Supply, and Installation of HSS System Equipment". The Contractor include the Local Contractor and Foreign Contractor. 1.17. "The Manufacturer" means Foreign Contractor and/or other manufacturers of related equipment. 1.18. "Foreign Part" means the Hardware, Firmware, Software and Software License, services as well as other works to be performed by Contractor as further specified in the Annex 1- Price List and Annex 6 - Responsibility Matrix and in any other part of this Contract. 1.19. "Local Part" means the Services as well as other works to be performed by as further specified in the Annex 1- Price List and Annex 6 - Responsibility Matrix and in any other part of this Contract. 1.20. "Total Contract Price" shall include the Contract Price Net Plus Corporate Income Tax portion of FCWT and Value Added Tax specified in the Annex 1- Price List to this Contract. 1.21. "Contract Price Net" means the total price payable in full by Buyer to Contractor under this Contract, exclusive of any interest on the retention payment, and any penalty amounts (if any). Contract Price Net does not cover any taxes, duties, levies, fees, or other expenses arising inside
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	Vietnam at the present or in the future in connection with the execution of this Contract. 1.22. “Foreign Contractor Withholding Tax” or “FCWT” means a tax covering the Corporate Income Tax (CIT) part and the Value Added Tax (VAT) part, in accordance with and subject to the Decree No. 320/ND-CP dated 15/12/2025 and Circular No. 20/2026/TT-BTC dated on 12/03/2026 by Vietnamese Ministry of Finance. As defined in this Contract, the FCWT shall cover only the CIT part. This CIT is specified as an extra item of the Price List and shall be withheld and paid by the Buyer directly to Vietnamese Tax Office on behalf of the Contractor. The VAT part, which is excluded from the FCWT of this Contract, shall be paid by the Buyer with the Buyer’s own budget to Vietnamese Tax Office in accordance with Vietnamese applicable laws and regulations. 1.23. “Firmware” means the set of readable instructions licensed to Buyer by Contractor on solid state devices or other similar media to be provided by Contractor and which are necessary for the control, operation and performance of the system in accordance with the requirements of the specifications of this Contract. 1.24. “Software” means the sets of computer programs in machine-readable code delivered by Contractor on magnetic tape or other storage media or modes, intended to be loaded into the memory of the system’s processing units for purpose of operating and maintaining the System supplied by Contractor under the Contract. 1.25. “Hardware” means all equipment and items (other than Firmware and Software) designed, developed by Contractor and manufactured by or on behalf of Contractor and required to complete a system performing in accordance with the system specification specified in the Contract. 1.26. “License” means the license granted by Contractor to the Buyer on the Hardware, Firmware or Software under this Contract. 1.27. “Related Services” means the services incidental to the supply of the equipment such as insurance, Site Survey
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	& Design, Installation, Integration & Testing... and other such obligations of the Contractor under the Contract. 1.28. “Spare Parts” means such replacement items of the Hardware as specified in Annex 8- List of Material. 1.29. “Date of Completion” means the date(s) specified in Annex 4- Implementation Schedule on which the Hardware and/or Software shall be delivered and related Services and RTU shall be performed, and notified as ready for the applicable acceptance activities, taking into account all extensions or postponements in accordance with this Contract. 1.30. “Delivery Acceptance Certificate” means the documents which is signed by Contractor and End-User certifying that the Supplies of each shipment has been delivered to the End-User’s Project site. 1.31. “Overall Delivery Acceptance Certificate” means the document which is signed by Buyer, Foreign Contractor, Local Contractor and End-User certifying that all the Supplies of the Contract have been delivered to the all the End-User’s Project sites. 1.32. “Supplies” means the generic term for the Equipment, Hardware, Software/Software Right to Use and Service to be purchased by Buyer and delivered by Contractor to Buyer under this Contract with facilities and functions as described in the Specifications of the Contract or agreed alternations specified in a corresponding amendment to this Contract (if any). 1.33. “Associated Documentation” means operating manuals, user’s manuals, programming manuals, modification manuals, flow charts, drawings and software listings which are designed to assist or supplement the understanding or application of Software. 1.34. “End-User” means VNPT Net Corporation. 1.35. “The End-User’s Project site” where applicable, means the actual location where the System is to be installed. 1.36. “Last Major Shipment of Contract” means the shipment with which the aggregate invoice amount of the
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	Supplies of the Foreign Part shipped has reach 100% of its price of Contract (Including free of charge Hardware, free of charge Software and free of charge Spare Parts). The date of Last Major Shipment is arrival date to the port/airport of Vietnam which shall be shown on the Arrival Notice which issued by Vietnam transportation agent.
2. Contract Documents and Order of Priority	2.1. All of the documents specified in Section 2.2. – GCC (including all parts thereof) form the Contract Agreement which is read as a whole; are intended to be correlative, complementary and mutually explanatory. 2.2. All documents forming the Contract Agreement are arranged in the following order of precedence: a) Contract Agreement, enclosing Appendices thereto; b) The SCC of the contract have been fully filled in and include any corrections, additions, and clarifications made during the process of selecting the contractor, negotiating the contract, and finalizing the contract (if any); c) Minutes of Contract Negotiation (if any), minutes of Contract Finalization; d) GCC; e) Decision Approving the Bidder Selection Results; f) Letter of Acceptance of Bid and Contract Award; g) Bid and written Bid clarifications submitted by the Bidder (if any); h) BD and Documentary Evidence of BD Modifications or Addenda (if any); i) Other Documents specified in SCC. 2.3. The Contract Documents are part of the contract dossier stipulated in Article 65 of the Law on Bidding and are digitally signed by the parties to form an e-contract, including: a) The Contract Agreement; b) The Particular Conditions of Contract, which are fully completed and include all adjustments, additions, and clarifications made during the bidder selection process;

	c) Contract appendixes, including a detailed list of the scope of work, a price schedule, and a performance schedule (if any); d) Other documents (if any).
3. Governing Law and Language	3.1. Applicable law: The Governing Law and Jurisdiction of the Contract shall be Law of Socialist Republic of Vietnam. 3.2. Applicable language: The Contract shall be made in English. All other letters and documents related to this Contract shall be made in that language and Vietnamese (if any).
4. Notices	4.1. Any notice given by one party to the other pursuant to the Contract shall be in writing to the address specified in the SCC. The term “in writing” means communicated in written form with proof of receipt. 4.2. A notice shall be effective when delivered or on the notice’s effective date, whichever is later.
5. Performance Security	5.1. The Performance Security must be submitted to the Employer no later than the date specified in the Letter of Acceptance of Bid and Contract Award. The Performance Security shall be in one or more of the following forms: a) A deposit via certified check, cash, or bank transfer to the Employer’s account for Performance Securities valued at less than 50 million VND, with the certified check’s validity period aligning with the project’s implementation schedule; b) A letter of guarantee from a domestic credit institution or a foreign bank branch established under Vietnamese law; c) A guarantee insurance certificate from a domestic non-life insurance enterprise or a foreign non-life insurance enterprise branch established under Vietnamese law. The Performance Security specified in points b and c of this section shall be an unconditional guarantee (payable on demand), following the format in Chapter VIII -Part 3 or another format approved by the Employer.

	5.2. The value and validity period of the Performance Security' guaranteeing performance of the Contract shall be as prescribed in the SCC. 5.3. The proceeds of the Performance Security shall be payable to the Employer as compensation for any loss resulting from the Contractor's failure to complete its obligations under the Contract. 5.4. The Performance Security shall be discharged by the Employer and returned to the Contractor within the period specified in the SCC.
6. Subcontracting	6.1. The Contractor may subcontract the Subcontractor on the List of Subcontractor specified in the SCC to perform Related Services offered in its Bids. Subcontracting shall in no event relieve the Contractor from any of its obligations under the Contract. The Contractor shall assume liability for the quantity, quality, progress and other obligations for any part of the works that its subcontractor execute. The replacement or addition of subcontractors from the list provided in the Bid, or any change to the subcontracting details in the Bid, shall only be carried out with the Employer's approval. The use of subcontractors must be appropriate for the Contractor's needs in executing the contract, and the subcontractors must meet the capacity and experience requirements of the Contractor. 6.2. The Contractor is responsible for making full and timely payments to the subcontractors in accordance with the terms agreed upon between the Contractor and the subcontractors.
7. Settlement of Disputes	7.1. The Employer and the Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract. 7.2. If, within the period specified in SCC following the day on which the dispute arises, the parties have failed to resolve their dispute by such mutual consultation, then

	either party may require that the dispute be referred for resolution to the formal mechanisms specified in the SCC.
8. Scope of Supply	The Goods and Related Services to be supplied shall be as specified in Chapter V.
9. Schedule of Delivery of Goods, Completion of Related Services (if any) and Documents	The Delivery of the Goods, Related Services shall be in accordance with Chapter V – Technical Requirements. The Seller shall provide invoices and/or other documents prescribed in the SCC.
10. Contractor's Responsibilities	The Contractor shall supply all the Goods and Related Services (if any) included in the Scope of Supply in accordance with Article 8 – GCC, and the Schedule of Delivery and Completion of Related Services as per Article 9 – GCC.
11. Types of Contract and Contract Price	11.1. Contract type shall be as specified in the SCC. 11.2. The Contract Price specified in the SCC includes all costs and expenses for completion of supply of the Goods and Related Services in the procurement as indicated in the Contract Price Schedule on a basis that the schedule of supply and requirements concerning quality of the Goods and Related Services are satisfied.
12. Taxes, Duties, Fees or Charges	12.1. The Contractor shall be entirely responsible for all taxes, duties, levies, fees or charges imposed until the Goods have been delivered to the Employer. 12.2. If any tax exemptions, reductions, allowances or privileges may be available to the Contractor, the Employer shall use its best efforts to enable the Contractor to benefit from such incentive policies. 12.3. Tax adjustment shall be subject to the regulations laid down in the SCC.
13. Advance Payment	13.1. The Employer shall provide the Bidder with the advance payment specified in the SCC after the Contractor have furnished the Advance Payment

	Security equivalent to the advance sum. The Advance Payment Security shall be issued by a credit institution or foreign bank branch constituted under Vietnam's domestic law. 13.2. The Advance Payment shall be used by the Contractor for performance of the Contract. The Contractor shall establish that the Advance Payment has been used to serve correct purposes and objectives by submitting copies of invoices, payment documents or other relevant documents to the Employer.
14. Payment	14.1. The written Payment Request, enclosing the invoice including description of the Goods already delivered and Related Services already executed, together with documentary evidence submitted under Article 9 - GCC, shall be notified and sent to the Employer upon completion of other obligations specified in the Contract. 14.2. Payment shall be made as per the SCC. 14.3. Payment currency: Payment currency of this Contract shall be calculated in US Dollars (USD) and Vietnamese Dong (VND).
15. Copyright	- The copyright in all drawings, documents, and other materials containing data and information furnished to the Employer by the Contractor shall remain vested in the Contractor. If they are furnished to the Employer directly or through the Contractor by any third party, the copyright in such materials shall remain vested in such third party.
16. Utilization of Documents and Information Related to the Contract	16.1. The Employer and the Contractor shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data, or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following completion or termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor such

	documents, data, and other information it receives from the Employer to the extent required for the Subcontractor to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor an undertaking of confidentiality of these materials. 16.2. The Employer shall not use such documents, data, and other information received from the Contractor for any purposes unrelated to the Contract. Similarly, the Contractor shall not use such documents, data, and other information received from the Employer for any purpose other than the performance of the Contract. 16.3. The obligations of the Employer and the Contractor under Section 16.1 and 16.2 - GCC, however, shall not apply to information that: a) the Employer or the Contractor need to share with the competent authority; b) now or hereafter enters the public domain through no fault of either the Employer or the Contractor; c) can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party; d) otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality. 16.4. The above provisions of Article 16 – GCC shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the supply of the Goods and Services. 16.5. The provisions of Article 16 – GCC shall survive completion or termination, for whatever reason, of the Contract.
17. Specifications and Standards	The Goods and Related Services supplied under this Contract shall conform to the technical specifications and standards mentioned in Chapter V; when no applicable standard is mentioned, the standard shall be equivalent or superior to the official standards whose application is

	appropriate to the Goods' country or territory of origin.
18. Packing	18.1. The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their project site (final destination), as indicated in the Contract. During transit, the packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures, salt and precipitation, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination, means of transport, handling facilities, etc. from the place of departure to the project site (final destination). 18.2. The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified in the SCC, and in any other instructions ordered by the Employer.
19. Insurance	Unless otherwise specified in the SCC, the Goods supplied under the Contract shall be fully insured against loss or damage incidental to manufacture or acquisition, transportation, storage, and delivery, in the manner specified in the SCC.
20. Transportation and Incidental Services	20.1. Transportation and other requirements shall be in accordance with the SCC. 20.2. The Contractor may be required by the Employer to provide any or all of the following services, including additional services, if any, specified in the SCC: a) performance or supervision of on-site assembly and/or start-up of the supplied Goods; b) furnishing of tools required for assembly and/or maintenance of the supplied Goods; c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;

	d) operation or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Contractor of any warranty obligations under this Contract; e) training of the Contractor's personnel in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods. 20.3. Prices charged by the Contractor for incidental services, if not included in the Contract Price for the Goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the Contractor for similar services.
21. Inspections and Tests	21.1. The Contractor shall at its own expense and at no cost to the Employer carry out all such tests and/or inspections of the Goods and Related Services as are specified in the SCC. 21.2. The inspections and tests may be conducted on the premises of the Contractor or at point of delivery, and/or at the Goods' project site (final destination). Subject to Section 21.3 – GCC, if conducted on the premises of the Contractor or others, all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Employer. 21.3. The Employer or its designated representative shall be entitled to attend the tests and/or inspections referred to in Section 21.2 – GCC, provided that the Employer bear all of its own costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses. 21.4. Whenever the Contractor is ready to carry out any such test and inspection, it shall give a reasonable advance notice, including the place and time, to the Employer. The Contractor shall obtain from any relevant third party or manufacturer any necessary permission or

	consent to enable the Employer to attend the test and/or inspection. 21.5. The Employer may require the Contractor to carry out any test and/or inspection not required by the Contract but deemed necessary to verify that the characteristics and performance of the Goods comply with requirements of the Contract, provided that the Contractor's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of manufacturing and/or the Contractor's performance of its other obligations under the Contract, due adjustments will be made in respect of the Delivery Dates and Completion Dates and the other obligations so affected. 21.6. The Contractor shall provide the Employer with a report of the results of any such test and/or inspection. 21.7. The Employer may reject any Goods or any part thereof that fail to pass any test and/or inspection or do not conform to the specifications. The Contractor shall either rectify or replace such rejected Goods or parts thereof or make alterations necessary to meet the specifications at no cost to the Employer. Then the Contractor shall repeat the test and/or inspection, at no cost to the Employer, upon giving a notice pursuant to Section 21.4 – GCC. 21.8. The Contractor agrees that neither the execution of a test and/or inspection of the Goods or any part thereof, nor the attendance by the Employer or its designated representative, nor the issue of any report pursuant to Section 21.6 - GCC, shall release the Contractor from any warranties or other obligations under the Contract.
22. Sanctions and Damages	Sanctions for any breach of the Contract and payment of damages shall be in accordance with the SCC.
23. Warranty	23.1. The Supplier warrants that all the Goods are new or unused according to the specified proposal. Others are specified in SCC.

	23.2. The Contractor further warrants that the Goods shall be free from defects arising from any act or omission of the Contractor or arising from design, materials, and workmanship, under normal use in the conditions prevailing in Vietnam. 23.3. Warranty validity period and place where the warranty is applied shall be as specified in the SCC. 23.4. The Employer shall give notice to the Contractor stating the nature of any such defects together with all available evidence thereof, promptly following the discovery thereof. The Employer shall afford all reasonable opportunity for the Contractor to inspect such defects. 23.5. Upon receipt of such notice, the Contractor shall, within the period specified in the SCC, expeditiously repair or replace the defective Goods or parts thereof, at no cost to the Employer. 23.6. If having been notified, the Contractor fails to remedy the defect within the period specified in the SCC, the Employer may proceed to take within a reasonable period such remedial action as may be necessary, at the Contractor's risk and expense and without prejudice to any other rights which the Employer may have against the Contractor under the Contract.
24. Patent Indemnity	24.1. The Contractor shall, subject to the Employer's compliance with Section 24.2 – GCC, indemnify and hold harmless to the Employer 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 Employer 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 the Goods by the Contractor or the use of the Goods in Vietnam; b) the sale of the products produced by the Goods. Such indemnity shall not cover any use of the 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 the 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 Contractor, pursuant to the Contract. 24.2. If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in Section 24.1 - GCC, the Employer shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. 24.3. If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. 24.4. The Purchaser 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. 24.5. The Employer shall indemnify and hold harmless the Contractor and its employees, officers, and Subcontractor 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
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	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 Employer.
25. Change in Laws and Regulations	Unless otherwise specified in the Contract, if after the date of 28 days prior to the date including the Bid closing time, any law or regulation is enacted, promulgated, abrogated, or changed in 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 Article 11 – GCC.
26. Force Majeure	26.1. The Supplier shall not be liable for forfeiture of its Performance Security, liquidated damages or sanctions, or termination for default if and to the extent that it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure. 26.2. If a Force Majeure situation arises, a party's failure to carry out any of its obligations shall not be deemed breach or default of the Contract provided that the affected party: (a) has taken all reasonable, prudential and necessary alternative actions, all of which serve for the purpose of performing the terms and conditions of this Contract, and (b) continues to perform its obligations under the Contract to the extent that such performance is reasonable and realistic. 26.3. For purposes of this Contract, "Force Majeure" means an event or situation beyond the control of parties that is not foreseeable, is unavoidable, and causes

	impossibility of performance of contract not because of negligence or lack of care on the part of any party. Such events may include, but not be limited to, wars, riots, strikes, fires, floods, epidemics, quarantine restrictions, freight embargoes, or regulatory regulations or policies. 26.4. If a Force Majeure situation arises, the affected party shall promptly notify the other party in writing of such condition and the cause thereof within fourteen (14) days from the day of occurrence thereof. Simultaneously, it shall send the written confirmation of such force majeure event issued by a body having jurisdiction at the occurrence place. ➤ The affected party shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance in order to contain consequences thereof. 26.5. The period during which a party must complete a work under this Contract is extended by a period as long as the time that the party is unable to perform the work due to a force majeure event.
27. Contract Amendments	27.1. The Employer may order the Contractor to make changes within the general scope of the Contract in any one or more of the following: a) drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Employer; b) the method of shipment or packing; c) the place of delivery; d) the Related Services to be provided by the Contractor. e) schedule of execution of the Contract as indicated in Article 28 – GCC. 27.2. If any such change within the scope of contract as indicated in Section 27.1 - GCC causes an increase or decrease in the cost of, or the time required for, the Contractor's performance of any provisions under the Contract, an equitable adjustment shall be made in the

	Contract Price or in the Delivery/Completion Schedule, or both, and the Contract shall accordingly be amended by both parties. Any claims by the Contractor for adjustment under this Clause must be asserted within twenty-eight (28) days from the date of the Contractor's receipt of the Employer's change order. 27.3. Where the Contractor supplies a new version of goods that is made by the same manufacturer, is of the same origin as; has technical features, configurations, parameters, etc. equivalent to or better than, the version of the goods proposed by the Contractor in its Bid; and that meets the BD requirements, the Contractor must notify in advance in writing to the Employer to seek its approval. In this case, after considering its demand, the Employer may approve the Contractor's proposal provided that the unit price and other conditions of the contract remain unchanged. 27.4. In case where it is necessary to perform the related services not mentioned in this Contract, the Employer and the Contractor shall enter into the negotiation on the unit price which is aligned with the market price. 27.5. The Employer and the Contractor will conduct the negotiation to serve as a basis for signing contract appendices or addenda in case of contract modifications and amendments. 27.6. During the contract performance, the Contractor may propose cost-efficient solutions, including but not limited to the following: a) Actions to be taken and explanations for differences from the requirements set forth in the signed contract; b) Comprehensive analysis of the costs and benefits of each solution, including description and estimation of the costs (including life cycle costs) that may be incurred to the Employer if the Employer approves the Contractor's proposal; c) Impacts of each solution on contract performance.
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	27.7. The Employer may approve the Contractor's proposal if it demonstrates one of the following benefits without prejudice to the necessary functions of the Goods: a) Shortened delivery time; b) Reduced Contract Price or Life Cycle Cost to be paid by the Employer; c) Improvements in quality, effect and sustainability of the Goods to be supplied under this Contract; d) Any other benefits to be enjoyed by the Employer. If the Contractor's proposal is approved by the Employer and reduces the Contract Price, the Employer shall pay the Contractor according to the reduced amount of Contract Price at the rate specified in the SCC. If the Contractor's proposal is approved by the Employer and increases the Contract Price, but reduces the Life Cycle Costs, due to the impact of the factors specified at clause a, b, c and d of this Section, the Employer shall pay the Contractor according to the increased amount of Contract Price. <i>27.8. Other are specified in SCC</i>
28. Extensions of Time	28.1. If at any time during performance of the Contract, the Contractor or its subcontractor should encounter conditions impeding timely delivery of the Goods or completion of Related Services pursuant to Article 9 – GCC, the Contractor shall promptly notify the Employer in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Contractor's notice, the Employer shall evaluate the situation and may at its discretion extend the Contractor's time for performance, in which case the extension shall be ratified by the parties through their negotiation by amendment of, appendices or addenda to the Contract. 28.2. Except in case of Force Majeure event or situation specified in Article 26 – GCC, a delay by the Contractor in the performance of its Delivery and Completion obligations shall render the Contractor liable to the

	imposition of liquidated damages pursuant to Article 22 – GCC.
29. Contract Termination	29.1. Termination for Default a) The Employer, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Employer, may terminate the Contract in whole or in part: (i) if the Contractor fails to deliver any or all of the Goods within the period specified in the Contract, or within any extension thereof granted by the Employer pursuant to Article 28 – GCC; (ii) if the Contractor fails to perform any other obligation under the Contract; (iii) if the Contractor, in the judgment of the Employer, has engaged in the prohibited acts or practices, as defined in Article 89 in the Law on Bidding, in competing for or in executing the Contract. b) In the event the Employer terminates the Contract in whole or in part, pursuant to subparagraph a of this Section, the Employer may procure, upon such terms and in such manner as it deems appropriate, Goods or Related Services similar to those undelivered or not performed, and the Contractor shall be liable to the Employer for any incremental costs for such similar Goods or Related Services. However, the Contractor shall continue performance of the portion of Contract to the extent not terminated. c) Others are specified in SCC. 29.2. Termination for Insolvency The Employer may at any time terminate the Contract by giving notice to the Contractor if the Contractor becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to the Contractor, provided that such termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the Employer.
30. Export Restriction	Any export restrictions attributable to trade regulations from a country supplying those products/goods that substantially impede the Contractor from meeting its

	obligations under the Contract shall release the Contractor from the obligation to provide deliveries or services, always provided, however, that the Contractor can demonstrate to the satisfaction of the Employer that it has completed all required formalities, including applying for permits, authorizations and licenses necessary for the export of the Goods and Related Services specified under the Contract. In this event, termination of the Contract on this basis shall be inflicted by the Employer on the Contractor.
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Chapter VII. Special Conditions of Contract

Item	Content
GCC 1.1	The employer: VNPT Net Corporation. Buyer: VNPT Net Corporation authorized importer.
GCC 1.3	The Supplier (Contractor) is:
GCC 1.11	Project Site(s) /Final Delivery Site(s) is: Ha Noi, Ho Chi Minh. (The details are specified in the PART II Technical Requirements)
GCC 2.2	The following documents are integral parts of the contract: 1. This Contract shall prevail over all other Contract documents. In the event of any discrepancy or inconsistency within the Contract documents, then the documents shall prevail in the order listed above. 2. The annexes of the contract including: <i>Annex 1 – Price List</i> <i>Annex 2 – Statement of Compliance to Scope of Supply</i> <i>Annex 3 – Solution Description</i> <i>Annex 4 – Implementation Schedule</i> <i>Annex 5- Services Description</i> <i>Annex 6 – Responsibility Matrix</i> <i>Annex 7 – Technical Supporting Documents</i> <i>Annex 8 – List of Materials</i> 3. Other documents as agreed by the Parties (if any)
GCC 4.1	For notices, the Employers Owner’s address shall be: Attention: VNPT Net Corporation. Address: VNPT NET tower, 30 Pham Hung St., Tu Liem Ward, Ha Noi, Vietnam.
GCC 5.2	- Time of submit: Contractor shall submit the Performance Security of their respective portion to Buyer no later than fifteen (15) working days after the signing of the Contract by the Parties. - Form of Performance Security: The Performance Security shall be issued by a well-known state-owned bank in Vietnam or a foreign Bank’s branch in Vietnam approved by the Buyer/End-User and issued in Vietnamese and English languages by way of an unconditional and irrevocable bank guarantee in a form acceptable to the Buyer/End-User. All costs in respect of such guarantee shall be borne by the Contractor.

Item	Content
	- Performance Security shall cover (i) 10% of Total Contract Price (including CIT) of Foreign Part; (ii) 10% of Total Contract Price excluding VAT of Local Part (follow the form No. 23). - Validity of Performance Security: The Performance Security shall be valid up to thirty (30) days after the Final Acceptance Certificate (FAC) Date. - The beneficiary of Performance Security: VNPT Net Corporation + Account VND:1006153688 Bank name: Saigon – Hanoi Commercial Joint Stock Bank (SHB)- The Hanoi branch + Account USD:1006203567 Bank name: Saigon – Hanoi Commercial Joint Stock Bank (SHB)- The Hanoi branch - In cases the Final Acceptance Certificate (FAC) has not been signed in time, before 05 days of the expiry date of the Performance Security, the Bidder must extend the validity of the contract Performance Security
GCC 5.4	1. Deadline for refunding Performance Security: The Performance Security will be discharged by the Purchaser and returned to the Supplier not later than thirty (30) days after the date of Final Acceptance Certificate (FAC). 2. The return of Warranty bond: The Warranty bond will be discharged by the Purchaser and returned to the Supplier not later than thirty (30) days following the expire date of Warranty period.
GCC 6.1	List of Subcontractor: Not used
GCC 7.2	Time for Mediation: 15 business days from the receipt of the complaint document from the Employer or the Contractor. Dispute Resolution: Any disputes or conflicts related to the Contract that cannot be resolved through mediation will be addressed as follows: - If an attempt at settlement has failed, all disputes arising out of or in relation to this Contract shall be finally settled by Vietnam International Arbitration Centre (VIAC) in accordance with its Arbitration Rules. The place of arbitration is Ha Noi, Vietnam. - The arbitrary award shall be substantiated in writing. The decision of the arbitration shall be final and binding for both parties; - All costs related to arbitration will be borne by the losing party - The language for the arbitration shall be English or Vietnamese.
GCC 9	* <i>Shipment:</i>

Item	Content
	- The Contractor will deliver all the Hardware, Spare Parts, Software and Software RTU and Services of this Contract on the basis of DAP to End-User's Project Sites in Vietnam, Incoterm 2010, in which: + The Contractor shall supply the Hardware, Spare Parts, Software and Software License for the Right to Use as referred in the Annex 1- Price List on the basis of DAP to Vietnam seaport/airport in accordance with the terms and conditions of INCOTERMS 2010; + The Contractor shall be responsible for transportation (include loading/unloading and warehouse), insurance thereof for the Hardware, Spare Parts from the Vietnam port/airport to the End-User's Project Site where the Hardware is to be installed and insurance during the process installation, integration and commissioning to the date of PAC. Number of shipments of Contract to Vietnam Seaport/Airport shall be no more than five (05) shipments. The delivery plan shall be in line with the Implementation Schedule set forth in Annex 4 to this Contract. In case the number of the shipments to Vietnam Seaport/Airport exceeds five (05) shipments due to reasons solely attributed by the Foreign Contractor, all arising expenses for receiving the goods including storage charges, customs clearance fees, transportations to the End-User's Project Site etc. shall be borne by Foreign Contractor. In case the value of the shipments exceeds the Contract/Contract Price Net of Foreign part supplied by The Contractor as reference in the Annex 1- Price List, the Contractor shall bear all the cost and expenses arising from receiving the goods, including but not limited to the import tax, Value Added Tax (VAT). If the Buyer discovers any loss or shortage of the Supplies in comparison with invoices and packing list at the international airport/seaport, Vietnam, the Buyer shall inform the status of cargos to Parties in according with the Insurance Law of Vietnam to establish the survey report at spot. This survey report shall be the legal document in case of dispute and determine actual state of the Supplies for claim formalities. If deficiencies or missing of the Supplies is solely attributed to the Contractor's responsibility, the Contractor must replace the shortage and remedy the Supplies without delay at his own costs. If the deficiencies are due to transport, the Buyer and Contractor shall send immediately complaining letter requiring the Insurance Company for compensation.

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	When the Supplies are delivered to Project Sites by Local Contractor, if the Contractor and the Buyer/End-User discover any loss or shortage of the Supplies in comparison with the invoices and packing list at Project Sites, the Buyer/End-User and the Contractor's representative shall establish the survey report at spot. This survey report shall be the legal document in case of dispute and determine actual state of the Hardware, Spare Parts and Software for claim formalities. The Contractor must replace the shortage and remedy the Supplies without delay at his own costs. Arrival date of the Equipment shall be shown on the Arrival Notice which issued by transportation agent in Vietnam. - Sea Port/Airport of loading: any sea port/airport of outside Vietnam - Airport/seaport of discharge: NoiBai/TanSonNhat International Airports, and/or seaports in HaiPhong/Ho Chi Minh city, Vietnam. - Delivery place: To the End-User's Project Sites (installation site) in accordance with the terms and conditions of DAP to End-User's Project Sites in Vietnam, Incoterms 2010. The Contractor shall be responsible for the import costs (including but not limited to customs fee, import tax, storage fee...) for the value gap only in accordance with DAP terms to Port in Vietnam if the value of all shipments exceeds the Total Contract Price Net as stipulated in the Contract, provided that all costs are supported by legal evidence of the cost incurred. ✚ For Foreign Part - The Contractor shall notify the Buyer before the shipment and send to the Buyer the correct and official original shipping documents according to each shipment by fax/email within one (01) working day after the Airway Bill's/Bill of Lading's date of each shipment and send out one (01) full set of correct and official original shipping documents by DHL or express courier service within two (02) working days after the AWB date and/or seven (07) working days after B/L date and before shipment arrives in Vietnam. - The Contractor shall bear all costs accrued due to the delay of sending shipping documents above. <u>Shipping documents shall include:</u> a) Clean Bill of Lading (B/L) showing seaport name of discharge: "Sea port in Ho Chi Minh and/or Haiphong city, Vietnam" in one (1/3) original and/or Clean Airway Bill (AWB) in one (01) original showing airport

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	name of discharge: “Tan Son Nhat airport/Noi Bai airport Vietnam” showing flight number, flight date/on board date, Letter Credit number, Contract number, notify to, consignee as....(name of Buyer), and having its principal/registered office at(address:.....) and marked “Freight Prepaid”, in one (01) original and two (02) copies for each shipment. b) Invoice for 100% of the Price Net and related CIT amount of Contract of the delivered Foreign Part’s Hardware; Software and Software Right to Use supplied by The Contractor in three (03) originals. c) General packing list in three (03) originals. d) Certificates of Origin showing the Contract number, Letter Credit number, shipment number and/or invoice number issued by the Chamber of Commerce of the manufacturer’s country and/or Foreign Contractor’s country in one (01) original and one (01) copy. e) One original of confirmation letter issued by the Contractor showing the Contract number, letter of credit number, shipment number and invoice number, by which the Contractor guarantees the Hardware, Software and Software RTU of each shipment is covered by the valid Certificate of Insurance will be included with the Contractor’s confirmation letter. f) Certificate of Quality issued by the manufacturer and/or the Contractor showing the manufacturing year of production, Contract number, shipment number and/or invoice number and End-User as VNPT Net Corporation in one (01) original and two (02) copies. * Description of Supplies in General packing list of each shipment shall be in conformity with the material list of Contract. * The detailed Packing List shall also be sent to the Buyer by E-mail and container information also be sent to the Buyer in one (01) original (If requested by Buyer). * The Contractor shall bear all costs accrued due to the delay of sending the above shipping documents mentioned in this Article which is attributable to the Foreign Contractor’s faults. Packing: shall be made in accordance with the export packing standard. Detailed invoice shall be in conformity with the detailed price of the Contract. The Supplies name in the Packing List and the Invoice shall be in full name and not be abbreviated and are the same in the Contract. Supplies shall be listed separately for each case.

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	* In case of air shipment of the Foreign Part supplied by Foreign Contractor, all equipment of each shipment shall be delivered to the airport of destination in full in comparison with the shipping document of each shipment (In the same flight). * In case of air shipment, Clean Air Way Bill (AWB) has no remark "Dangerous good or DG". * All shipping documents of shipments under this Contract presented by the Contractor should show the Contract number, Letter Credit number (for Foreign part supplied by Foreign Contractor), name of Buyer and name of Contractor. * The Contractor shall provide the End-User/Buyer with the list of Part Number for all the Supplies under this Contract before shipments and serial number upon Buyer's receipt of the Supplies. * The number of document (originals and copies) are specified in the Articles 14.2 of SCC in the Contract. * The Contractor will ensure safety of goods and equipment in parcels during transport. If the Buyer finds out any damage or loss or goods missing with respect to the invoices and packing lists, the Buyer shall inform the status of cargos to the Contractor and the Contractor shall immediately request the Insurance company to make a report on site. This report shall be legal evidence in case of disputes in defining equipment/goods status and shall be a basic for complaining. * If the minor damage, deficiencies or losses, goods missing due to transport, the Contractor and the Buyer will send immediately complaining letter requiring the Insurance company to compensate. If deficiencies or goods missing are only attributable to the Contractor, the Contractor shall be responsible for replacing, remedying at the Contractor's cost, failing such obligations as mentioned above, the Buyer shall have the right to claim the Contractor for compensation. The Contractor shall pay such amount by bank transfer to the Buyer's account within thirty (30) days from the date of the Buyer's request. If the Contractor fails to transfer the compensation amount as stipulated time, the Buyer shall claim the amount from Performance Security deposited by the Contractor to the Buyer under the Contract. In case the Buyer decides to claim the amount from Performance Security, the Buyer shall inform the Contractor 15 days prior to sending the claim to the bank.

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	* The Contractor will take full legal responsibility of the transportations, drivers, co-drivers and the 3rd concerning person for risks occurring, as well as observance of the law on road traffic safety during transportation or unloaded from receiving to delivering goods; observance of the regulations on the transportation, loading and unloading of the competent State; ensure adequate legal conditions for vehicles on the road: the registration papers in valid, the insurance for people and devices; means machinery for loading and unloading goods, ... * In case the risk of accidents or damage vehicles happen, the Contractor shall immediately notify the Buyer/End-User and promptly ordered vehicle to replace and solve all problems in order to ensure delivery schedules and bearing the costs incurred (if any) to complete the delivery to the investment owner as prescribed. <u>Marking:</u> - Equipment shall be packed in customary export cases. - Information needs to be specified on the outside of the cases: The marking shall indicate the Shipper's name and address; Contractor's name and address; Consignee's name and address, Contract and port of destination, Case number, gross weight (including packing materials) and net weight, dimensions of cases, Site name, Instructions for loading and unloading, transportation.
GCC 11.1	Type of contract: Lump-sum
GCC 11.2	Contract Price: Fixed 2.1. The Total Contract Price is USD (In words: United States Dollars) and VND (In words, Vietnamese Dong). ✓ The Total Contract Price is total price of Goods & Services which shall be delivered as of DAP to the End-User's Project Sites in accordance with the terms and conditions (which are specified in Article 1.11 of SCC). Detail as following: The Contractor shall supply the Hardware, Spare Parts, Software, Software License for the Right to Use and Services as referred in the Price List on the basis of DAP to End-User's Project Sites in Vietnam, in which: + For Foreign Part (include: The Hardware, Spare Parts, Software and Software License for the Right to Use and Services and as referred in the Price List supplied by Contractor). The price condition of Total

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	Contract Price for Foreign part supplied by Contractor is CIP/CIF Vietnam port/airport in accordance with the terms and conditions of INCOTERMS 2010; + For Local Part (include: the installation materials and the technical services as stipulated in the Price List - Service Description and the Annexes attached with the Contract) supplied by Contractor. The price condition of Total Contract Price for Local Part supplied by Contractor is DDP to End-user's Project Sites and Contractor shall be responsible for transportation and insurance thereof for Foreign Part from Vietnam port/airport to End-User's Project Sites, the insurance during the process of installation, integration and commissioning to the date of PAC. + Others responsibility are as specified in the main Contract. 2.2. The Total Contract Price consists of the Foreign Part and Local Part plus Corporate Income Tax portion of the Contractor Withholding Tax and Value Added Tax subjected to Local Services portion of the Local Part. As of the Annex 1 of the Contract, the Contract Price of the Foreign Part plus CIT portion of FCWT is USD (In words: United States Dollars) and the Contract Price of the Local Part (VAT excluded) is VND (In words, Vietnamese Dong), of which: - The Contract Price Net amounts to: USD and VND (In words: United States Dollars and Vietnamese Dong) consist of: + The Contract Price Net for Foreign Part amounts to: USD (In words: United States Dollars). + The Contract Price Net for Local Part amounts to: VND (In words: Vietnamese Dong). - The Corporate Income Tax portion (CIT) of The Contractor Withholding Tax amounts to: USD (In words: United States Dollars). - Value Added Tax (VAT) shall be added on the VAT Invoices for Local Part supplied by Contractor equal to VND (In words:). The Value Added Tax (VAT) is ten percent (10%) in accordance with the Laws and Regulations of Vietnam.
GCC 12.3	Tax adjustment: "Allowed". During performance of the Contract, if, at the time of payment, there is any change (increase or decrease) in taxes; and the contract prescribes that tax adjustment is allowed; at the same time, the contractor can furnish documents on determination of the tax

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	amounts incurred, the difference in tax amounts payable between tax regulations will be handled by necessary adjustments made under terms and conditions of the Contract.
GCC 13.1	Down payment: As mentioned in Article 14.2 below The Bank Guarantee for Down Payment: <i>Time of submit:</i> Each Contractor shall submit the Bank Guarantee for Down Payment of their respective portion to the Buyer no later than fifteen (15) working days after the signing of Contract by the Parties. <i>Form of Bank Guarantee for Down Payment:</i> Bank Guarantee for Down Payment of Contract shall be issued by a state-owned bank in Vietnam or the Contractor' bank which has branch in Vietnam approved by the Buyer/End-User and issued in English and Vietnamese languages by way of an unconditional and irrevocable bank guarantee in a form acceptable to the Buyer. All costs in respect of such guarantees shall be borne by respective Contractor. <i>Bank Guarantee for Down Payment shall cover</i> (i) 10% of Price Net of Contract (excluding CIT) of Foreign Part; (ii) 10% of Price Net (Excluding VAT) of Local Part (follow the form No. 24). <i>Validity of Bank Guarantee for Down Payment:</i> The Bank Guarantee for Down Payment shall be valid up to thirty (30) days after the date of Overall DAC of Contract. Each Bidder shall be responsible for the Bank Guarantee for Down Payment of their portion.
GCC 14.2	Payment method: The Invoicing and Payment terms: The Total Contract Price is USD.... (In words: United States Dollars) and/or VND... (In words: Vietnamese Dong), of which: - USD _____ (In words: _____ United States Dollars) is the amount payable to Contractor for Foreign Part (the “Contract Price Net for Foreign Part Payable Amount”) on the basis of DAP to port in Vietnam. - VND _____ (In words: _____ Vietnamese Dong) excluded VAT is the amount payable to Contractor for Local Part (the “Contract Price Net for Local Part Payable Amount”). - USD _____ (In words: _____ United States Dollars) is the Corporate Income Tax part of The Contractor Tax (CIT).

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	- VND _____ (In words: _____ Vietnamese Dong) is Local Part's Value Added Tax (VAT). <i>The following method of payment shall be applied to this contract:</i> <u>14.2.1 For Foreign Part</u> Invoicing will be in US Dollars (USD) and Payments will also be made in USD. a) Down Payment Ten percent (10%) of the Foreign Payable amount of contract i.e. USD (In words, United States Dollars) shall be paid by Telegraphic Bank Transfer (T/T) within thirty (30) days after the Buyer's receipt of the following documents: - Three originals of proper Commercial Invoice for 10% of the Price Net of Contract for the Foreign Part supplied by Contractor. - One original of Performance Security for Foreign Part cover ten percent (10%) Total Contract Price (as stipulated in the Article 5.1, SCC of the Contract) supplied by Contractor for the value of USD (In words: <i>United States Dollars</i>) issued by the Contractor's bank as per Article 9 hereof and Performance Security Amendment (if any). - One original of Bank Guarantee for Down Payment for Foreign Part cover ten percent (10%) Price Net of Contract (as stipulated in the Article 13.1, SCC of the Contract) for the value of USD (In words: <i>United States Dollars</i>). Despite of the provisions hereinabove, the Advance Payment will not be made until the Advance Payment Guarantee and Performance Security has been provided in compliance with Article 13.1 of the SCC. - The payment shall be remitted to Contractor's bank accounts as follows: + Contractor's account - Bank name: - SWIFT code: - Account number: - Beneficiary: + Contractor's account - Bank name: - Bank's address: - Beneficiary: - Account no: b) Balance Payment Payment of 90% of the Contract's price net for the Foreign Part Supplied by Foreign Contractor by an irrevocable and confirmed Letter Credit (L/C) at sight.

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	Ninety percent (90%) of the Contract's Price Net for the Foreign Part Supplied by Foreign Contractor with the value of USD(In words, United States Dollars) shall be paid by an irrevocable and confirmed Letter Credit (L/C) at sight by mixed payment that will be issued within thirty (30) days from: (i) the Contract Effective Date and; (ii) the Buyer's receiving date of Performance Security and Down Payment Guarantee from Foreign Contractor by the Buyer and valid until forty five (45) days after the Final Acceptance Certificate date of Contract. The L/C opening fees, the transferring fees and other fees relating to this Letter of Credit arising outside and inside of Vietnam shall be borne by the Foreign Contractor. All Letter of Credit amendment fees will be borne by the requesting Party. Within three (07) working days after the Signing date of Contract, provided that the Buyer has given the name of issuing bank on the Contract Effective Date by E-mail, the Foreign Contractor will send a written notice to the Buyer the Beneficiary's advising bank information including: Beneficiary's bank (Full name and Address): Swift code: The L/C payment will be made as follows: <i>b1) Thirty percent (30%) of the Price Net of Foreign Part's Hardware of Contract amount i.e. USD (In words, United States Dollars) shall be paid at sight to the Foreign Contractor upon delivery completion of the all shipments against the Foreign Contractor's presentation to the bank of the following documents, within the validity of the L/C:</i> - Signed commercial invoices showing thirty percent (30%) of the Price Net of Foreign Part's Hardware of Contract, the Contract number and L/C number in three (03) originals. - One (01) original Overall Delivery Acceptance Certificate (ODAC) of Contract duly signed by the Foreign Contractor, Local Contractor, the Buyer and the End-User. - One (01) Original Protocol of Delivery Progress - Shipping documents of all shipments, each shipment includes: + One (01) Original Clean Airway Bills (AWB) for each shipment showing airport name of discharge "Tan Son Nhat airport, Ho Chi Minh City/NoiBai airport, Ha Noi", showing consignee <i>as (name of Buyer or Import Company authorized of Buyer)</i>, a company having its

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	principal/registered office at (<i>address...</i>), showing flight number, flight date, Contract number, and marked “Freight Prepaid” and notify (<i>name of Buyer or Import Company authorized of Buyer</i>), and/or. + 2/3 set of originals clean shipped-on-board Bill of Lading (B/L) for each shipment showing discharge port name in Ho Chi Minh and/or HaiPhong City, showing consignee as (<i>name of Buyer or Import Company authorized of Buyer</i>), a company incorporated in Viet Nam and having its principal/registered office at (<i>address...</i>) marked “freight prepaid”, Contract number, L/C number and notify (<i>name of Buyer or Import Company authorized of Buyer</i>), and. + Three (03) originals of Signed Invoices for one hundred percent (100%) of total price net of each shipment (including hardware, software and software right to use) and corresponding CIT portion (corresponding CIT portion will not be paid on Advance Payment. Corresponding CIT portion will be withholding by the Buyer for tax payment on behalf of Contractor to the Vietnam state budget). The Invoice must show Contract number, Letter of Credit number and supplies’ original country. +Three (03) originals of General Packing List of each shipment showing shipment number and/or Invoice number, Contract number and L/C number. + One original of confirmation letter issued by the Contractor showing the contract number, letter of credit number, shipment number and invoice number, by which the Contractor guarantees the Hardware, Software and Software RTU of each shipment is covered by the valid Certificate of Insurance. One copy of this valid Certificate of Insurance will be included with the Foreign Contractor’s confirmation letter; + One (01) original of Insurance Certificate/Policy for each shipment showing the assured party as (<i>name of Buyer or Import Company authorized of Buyer</i>), having its principal/registered office at (<i>address...</i>) or in assignable form, covering 110% of the shipment value for ALL RISKS, WAR and SRCC conditions, showing Contract number, shipment number and/or Invoice number and claim payable in Vietnam in the currency of the Invoice. + Two (02) copy of Certificates of Origin for each shipment showing the Contract number, L/C number, shipment number and/or Invoice number issued by the Chamber of Commerce of the manufacturer’s country and/or Contractor’s country.

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	+ One (01) original of Certificate of Quality issued by the manufacturer and/or Contractor showing the manufacturing year of production, Contract number, shipment number and/or Invoice number and End-User as VNPT Net Corporation. - One (01) original of Beneficiary's certificate certifying one full set of original shipping documents of each shipment as above-mentioned have been sent directly to the applicant by an express courier within (02) working days from the date of AWB and within seven (07) days from the date of B/L. - One (01) original of Insurance Certificate for Foreign Part transportation from Vietnam port/airport to End-User's Project Sites <i>b2) Payment after Provisional Acceptance Certificate (PAC)</i> Thirty percent (30%) of the Hardware Price Net equal to USD and sixty percent (60%) Price Net of Software/Software Right to Use equal to USD for Foreign Part of Contract supplied by The Contractor sum total amount USD (In words, United States Dollars) shall be paid at sight after the date of Provisional Acceptance Certificate (PAC) of Contract, against the Foreign Contractor's presentation of draft at sight accompanied with the following documents, within the validity of the L/C: - One (01) original of Provisional Acceptance Certificate (PAC) signed by the Foreign Contractor, Local Contractor, the Buyer and the End-User; - One (01) original of Protocol of PAC Progress to be duly signed by the Foreign Contractor, End-User, Buyer; and Local Contractor. - Three (03) originals signed Commercial invoice for thirty percent (30%) of the Hardware Price Net and sixty percent (60%) of Software and Software Right to Use Price Net of Contract for the Foreign Part showing payable amount, Contract number and L/C number signed by Foreign Contractor; - Three (03) originals of Software License Certificate issued by the Contractor showing Contract number, L/C number and certifying that the End-User (VNPT Net Corporation) has got the right to use all the supplied software listed in the Contract number - One (01) original of Insurance Certificate during the process of installation, integration and commissioning to the date of PAC.

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	<i>b3) Payment after Final Acceptance Certificate (FAC)</i> Thirty percent (30%) of the Contract's Price Net for Foreign Part supplied by the Contractor amount i.e. USD (In words, United States Dollars) shall be paid at sight after the date of Final Acceptance Certificate (FAC) of Contract, against the Foreign Contractor's presentation to the Bank of the following document, within the validity of the letter of credit: - Three (03) originals of signed Commercial Invoice valued thirty (30) percent of Contract Price Net of the Foreign Part showing Payable Amount, Contract number, L/C number and signed by Foreign Contractor. - One (01) original of Final Acceptance Certificate (FAC) of Contract to be duly signed by the Foreign Contractor, Local Contractor, the Buyer and the End-User; - One (01) original of Protocol of Contract Progress to be duly signed by the Foreign Contractor, Local Contractor, the Buyer and the End-User. <u>14.2.2 For Local Part</u> The Contract Price Net for Local Part Payable Amount (VAT excluded) is VND (in words: Dong). Any and all payments and invoicing for Local Part supplied by Local Contractor shall be made by Telegraphic Bank Transfer (T/T) in Vietnam Dong to the Local Contractor's account as defined in Article 14.2.3 SCC. The payment for Local Part shall be made in the following manners: a) Down Payment of ten (10%) percent of the Contract's Price Net for Local Part by T/T Down Payment of ten (10%) percent of the Contract's Price Net for Local Part supplied by Local Contractor (VAT excluded) with the value of VND..... (in words, ...) shall be paid to the Local Contractor by T/T within 30 days after the Buyer's receipt of the following documents from - Three (03) originals of Payment Request signed by Local Contractor. - One (01) original of Performance Security for Local Part supplied by Local Contractor cover ten percent (10%) of Total Contract Price (as stipulated in the Article 5.1, SCC of the Contract) supplied by Local Contractor for the value of VND (In words, Vietnamese Dong);

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	- One (01) original of Bank Guarantee for Down Payment for Local Part supplied by Local Contractor cover ten percent (10%) of Contract's Price Net (as stipulated in the Article 13.1, SCC of the Contract) for the value of VND..... (In words, Vietnamese Dong). Despite of the provisions hereinabove, the Down payment will not be made until the Performance Security and the Bank Guarantee for Down Payment has been provided in compliance with Article 13.1 and 5.1 of the SCC of the Contract. b1) Payment after Overall Delivery Acceptance Certificate (ODAC) for Local Part Up to forty percent (40%) of the Local Payable Part (in words, ...) including Value Added Tax (VAT) equal to VND sum total amount VND (in words, ...) after deducting down payment shall be paid to the Local Contractor by T/T within thirty (30) days after the date of Overall Delivery Acceptance Certificate (ODAC) of Contract, against the Local Contractor's presentation to the Buyer of the following document: - Payment request signed by the Contractor in three (03) originals. - Signed financial invoice (VAT included) for 100% of the hardware of Contract for Local Part supplied by Local Contractor in one (01) original and one (01) certified true copy; - One (01) originals of Overall Delivery Acceptance Certificate (ODAC) of Contract. - One (01) Original of Clean Airway Bills (AWB) - One (01) Original of clean shipped-on-board Bill of Lading (B/L) for each shipment, - One (01) Original of Signed Invoices for one hundred percent (100%) of total price net of each shipment - One (01) Original of General Packing List of each shipment. - One (01) originals of Insurance Certificate/Policy for each shipment, having its principal/registered office at (address...) or in assignable form, covering 110% of the shipment value for ALL RISKS, WAR and SRCC conditions. - One (01) originals of Certificate of Quality issued by the manufacturer and/or Contractor showing the manufacturing year of production, Contract number, shipment number and/or Invoice number.

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	- One (01) originals of Insurance Certificate for Local Part transportation to End-User's Project Sites. b2) Payment after Provisional Acceptance Certificate (PAC) for Local Part - Up to seventy percent (70%) of the Local Payable Part (in words, ...) including Value Added Tax (VAT) equal to VND sum total amount VND (in words, ...) shall be paid to the Local Contractor by T/T within thirty (30) days after the date of Provisional Acceptance Certificate (PAC) of Contract, against the Local Contractor's presentation to the Buyer of the following document: - Payment request signed by the Contractor in three (03) originals. - Signed Financial invoice (VAT included) for the services supplied by Local Contractor in one (01) original and one (01) certified true copy; Signed Financial invoice (VAT included) for 100% of the equipment value of Contract for the equipment supplied by Local Contractor in one (01) certified true copy (if any); - One original of Provisional Acceptance Certificate (PAC) of Contract to be duly signed by the Buyer, End-User, Foreign Contractor and Local Contractor. - One (01) original of Overall Delivery Acceptance Certificate (ODAC) of Contract to be duly signed by the Foreign Contractor, the Buyer, End-User and Local Contractor. - One (01) original of Protocol of PAC Progress to be duly signed by the Foreign Contractor, End-User, Buyer; and Local Contractor. - One (01) original of Insurance Certificate during the process of installation, integration and commissioning to the date of PAC. - Local equipment's documents including (if any): <i>In case local equipment are made in Vietnam:</i> ◆ One original and one copy of Certificate of Quality issued by the manufacturer showing the manufacturing year of production, and End-User as VNPT Net Corporation. ◆ One original and one copy of the Software License Certificate issued by the manufacturer showing the End-User as VNPT Net Corporation and Software and/or Software Right To Use in conformity with respective Price list of the Contract (if any).

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	<i>In case local equipment are imported:</i> ◆ Two copies of customs declaration for the imported equipment. ◆ Two copies of Certificate of Origin to be issued by the Chamber of Commerce of the manufacturer's country. ◆ One original and one copy of Certificate of Quality to be issued by the manufacturer showing the manufacturing year of production, and End-User as VNPT Net Corporation. ◆ One original and one copy of the Software License Certificate issued by the manufacturer showing the End-User as VNPT Net Corporation and Software and/or Software Right To Use in conformity with respective Price list of the Contract (if any). (All copies of the above documents must be certified and officially sealed by the manufacturer or the importer). Local Contractor will send one (01) copy of the above documents to the following address for archives: VNPT Net Corporation - 30 Pham Hung St., Tu Liem Ward, Ha Noi, Vietnam. c) Balance Payment after Final Acceptance Certificate (FAC) for Local Part Thirty percent (30%) of Contract's Price Net for Local Part supplied by Local Contractor equal to VND (in words, ...) shall be paid within thirty (30) days after the date of Final Acceptance Certificate (FAC) against the Local Contractor's presentation to the Buyer of the following document: - Payment request signed by the Contractor in three (03) originals. - Signed Financial Invoice (VAT included) for 100% of the services value of Contract for Local Part supplied by Local Contractor in one (01) certified true copy. - Signed Financial invoice (VAT included) for 100% of the equipment value of Contract for Local Part supplied by Local Contractor in one (01) certified true copy (if any). - Final Acceptance Certificate (FAC) to be duly signed by the Buyer, End-User, Foreign Contractor and Local Contractor in one (01) original. - One (01) original Protocol of Contract Progress to be duly signed by the Buyer, End-User, Foreign Contractor and Local Contractor. - Warranty bond of Contract in one (01) original and two (02) copies. Value Added Tax (VAT) shall be added on the Commercial Invoices for Local Part Payable Amount of Contract. The current Value Added Tax

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	(VAT) is ten percent (10%) of the Local Part Payable Amount of Contract and can be adjusted if there is any change in Vietnamese Tax Law. The Buyer shall pay this VAT in accordance with the Laws and Regulations of Vietnam. 14.2.3 The account number a. Foreign Contractor's account Name of the Bank: Account number: ... b. Local Contractor's account Name of the Bank: Account number: ... 14.2.4 The Buyer shall withhold the Corporate Income Tax of the Contractor Withholding Tax according to the amount which is specified in Contract. Buyer shall be responsible for payment this tax to the Vietnam State Budget on behalf of Foreign Contractor. The Buyer shall provide one (01) copy of (i) Corporate Income Tax declaration and (ii) Corporate Income Tax Payment Receipt within thirty (30) days from the date of the tax payment. The VAT of FCWT (if any) shall be paid by the Buyer on behalf of End-User.
GCC 15	Intellectual Property Rights 15.1 If a third party rightfully raises claims due to infringement of intellectual property right which is effective in Vietnam in connection with the Supplies, the Contractor will at its discretion and costs, and excluding further liability, either: a) Get a license from the third party which owns a duly effective intellectual property right infringed by the Supplies, b) Or substitute these parts for other non-infringing parts, c) Or take back the Supplies concerned against the reimbursement of all relating fee. Claims shall be deemed rightful only if they are acknowledged by the Contractor or finally so adjudicated by a court or competent jurisdiction. 15.2. The obligation set forth in Section 15.1 above is conditional upon: a) The End-User/Buyer giving the Contractor notice in writing without undue delay of any claim being made against the End-User/Buyer or

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	action threatened to be brought against the End-User/Buyer or the Contractor and the End-User/Buyer has not made any admission with respect to the infringement of third party intellectual property rights which might be prejudicial to the defense against such claim or action; b) The End-User/Buyer permitting the Contractor at its own expense to have full authority and conduct any ensuing litigation and all negotiations for settlement of the claim; and c) The Contractor being informed of all circumstances which may be of relevance in the legal action and the End-User/Buyer providing all the necessary assistance and refraining from taking any steps in any legal action which may prejudice the rights of the Contractor. The Contractor shall not be liable for any settlements entered into and/or any expense or cost incurred by the End-User/Buyer without the prior written approval of the Contractor. In the event the Contractor fails to act against such claims or actions, the End-User/Buyer shall have the right to take appropriate legal action and reasonable expenses incurred therein shall be refunded by the Contractor. 15.3. The Parties hereto agree that Section 15.1 above shall constitute the entire liability of the Contractor and shall be the End-User/Buyer's sole and absolute remedy for any intellectual property infringement. 15.4. The indemnity shall not apply to any claim based on any of the following: a) Contractor's compliance with the End-User/Buyer's design or design instructions, or b) use of the Equipment or Software in a manner, or for a purpose, which was not foreseeable, or c) the assembly, function or use of the Equipment or Software in combination with any goods or software not supplied by Contractor, or d) the modification of the Equipment or Software by the End-user/Buyer or by any third party. 15.5. The Parties hereto agree that the End-User/Buyer shall lose its warranty rights, if it attempts to rectify defects or malfunctions on its own accord during the Warranty Period. In any case, such attempts do not constitute any proprietary rights of the End-User/Buyer in the Equipment. 15.6. The End-User/Buyer shall not, without the Contractor's prior written permission, delete, conceal or change or alter any of the Contractor or its subsidiary or affiliate companies' trade name, trademark, trade device, service mark, symbol, code or specification or any abbreviation, contraction or simulation thereof. 15.7. In respect to the Supplies containing Software acquired under this Contract, the End-user is hereby granted a perpetual, non-exclusive and

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	non-transferable license to use the Software for the purposes of operating the End-User's network in Vietnam. The End-user is granted no title or ownership rights or interests in the Software, where such title, rights and/or interest in the Software shall remain with the Contractor or Contractor's supplier at all times. The End-User further agrees with the Contractor that it shall not himself (or through any holding, subsidiary or associated company, agent or third party) modify, vary, enhance, copy, reproduce, adapt, disassemble, decompile, reassemble, translate, sub-lease, license, or otherwise deal with the Software and any part thereof. The documents may only be copied for recording or operational purposes or for purposes expressly permitted by the Contractor in writing. Any and all such copies shall contain the same proprietary and confidential notices and legends which appear on the original documentation. The license does not extend any rights to End-User in respect of the source code of the Software. 15.8. The End-User/Buyer acknowledges and agrees that the proprietary rights or interest or other intellectual property rights in the Supplies under this Contract shall remain with the Contractor. The End-User/Buyer also acknowledges that the validity and ownership of the Contractor's copyright in all the materials or spare parts supplied by the Contractor to the End-user/Buyer in connection with the Supplies under this Contract and all the right in its logos, emblems shall remain the property of the Contractor. The End-User/Buyer undertakes not to procure, cause the registration or attempt to register the Contractor's patent, industrial design in its own name and also not to claim any rights or interests whatsoever in the Contractor's copyright. 15.9. Subject to the approval of the authorized person of Vietnam Post and Telecommunication Group, End-User consents, in written form, to grant to Contractor (upon request of the Contractor, such consent not to be unreasonably withheld) either remote access or periodical physical access (including, but not limited to, installation of appropriate Software Monitoring Client into End-User's Network Management System) for the purpose of verifying product usage, activation compliance and invoicing of Software usage in accordance with agreed prices. Contractor shall own the copyright to the raw data that it has collected in such network via remote or physical access to such Network Elements (or System Elements) ("Data") and any and all aggregations and/or compilations of such Data into reports and/or any other documents and materials created by Contractor ("Report"). Contractor shall allow End-User to have access rights to a reasonable amount of copies of the Report containing Data directly relating to its Software usage for the purposes of checking invoicing and payments. End-user shall obtain prior written consent from the Contractor for access to all other Data and Reports.

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GCC 16.6	Confidential relationship
	a. Confidential Information shall mean all information, data, know-how, whether it is technical in nature or not, which is disclosed to the other Party, and which is related to research, technology, design, equipment and business activities or strategies of the proprietor, which is either marked or stated to be confidential, or is by its nature and/or its name reasonably intended to be confidential.
	b. The Parties hereby undertakes to keep and maintain the Confidential Information received from the other Party during the term of this Contract in strict confidence and to use it only in accordance with the purpose of fulfilling this Contract.
	c. The Parties hereby agree to use all reasonable efforts to take such actions as may be necessary and appropriate to prevent the unauthorized use and the disclosure of the same, and to keep and maintain all such Confidential Information in strict confidence, including but not limited to: (i) Ensuring that such Confidential Information is disclosed only to responsible employees of respective Parties who have a bona fide need to know such Confidential Information and who have been properly instructed to maintain such Confidential Information in strict confidence; (ii) Not to disclose to any third party the terms and conditions of this Contract or any Confidential Information; (iii) Not to disclose the methods of the manufacture and/or sale of the equipment information including the marketing plans or strategies; and (iv) To safeguard all documents and/or information against theft, damage, loss or access by unauthorized persons.
	d. Neither Party shall use the name of the other Party or the name of any of its Affiliates in any promotional material or make any publicity release regarding this Contract without prior written permission of the other Party.
	e. The Parties hereto agree that the Confidential Information disclosed to the other Party has been developed and acquired by the disclosing Party over many years at great costs and expense.
	f. The Parties agree that in the event of any violation of the duty of confidentiality and such violation constitutes a fundamental breach of this Contract and shall result in grave and serious injury and damage to the

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	other Party that no monetary damages can compensate such injury and damage. g. The Parties agree that money damages are not a sufficient remedy for any breach of this Contract by the receiving Party and that the disclosing Party shall be entitled to specific performance or injunctive relief as a remedy for any breach or threatened breach thereof, in addition to any other remedies available at law or in equity. h. The Parties agree that, notwithstanding the termination of this Contract for any reason whatsoever, the provisions in relation to the Confidential Information shall survive this Contract and shall be continuing obligations for a period of five (5) years from the date hereof. i. The Parties' duty of confidentiality herein shall not apply, however, to any part of the Confidential Information which: (i) was already obtained in good faith by the receiving Party prior to the receipt thereof; (ii) was already in the public domain or became so through no fault of the receiving Party; (iii) was acquired by the receiving Party from a third party having the absolute right to convey the Confidential Information to the receiving Party without violating any duty of confidentiality; (iv) is independently developed by the receiving Party; (v) is approved for the release of disclosure by prior written authorization by the owner of the Confidential Information; and (i) (vi) is required to comply with or fulfill governmental requirements, submissions to governmental bodies, or securing of regulatory approvals. k. Notwithstanding the above, Contractor may use or transfer any network data provided by the End-User/Buyer upon request of the Contractor for such purposes in connection with the proper execution of this Contract and scope of work therein. The Contractor may transfer any such personal data to the Contractor's affiliates that are located overseas where such transfer is required for the Contractor to perform its obligations under the Contract. The Contractor confirms that transfer of data will only take place if needed.
GCC 18.2	Packaging: Packaging shall be made in accordance with the export packing standard. Equipment shall be packed in customary export cases.

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	Information needs to be specified on the outside of the cases: + Shipper's name; address... + Consignee's name; address... + Contract No... + Dimensions of cases... + Instructions for loading and unloading, transportation...
GCC 19	- The Foreign Contractor shall be responsible for insurance of goods of all types according to insurance conditions ALL RISKS, WAR, SRCC, covering 110% of invoice value showing Contract number, shipment number and/or invoice number and payable in Vietnam with respect to every risk occurred in international transportation to the port of discharge. - The Local Contractor shall be responsible for insurance of goods of all types inside Vietnam with respect to all risk occurred in local transportation and during the process of installing, integrating and commissioning to the date of PAC.
GCC 20	Delivery requirement for Contract: - All shipments to End-User's Project Sites (installation site): In line with the implementation and technical acceptance of the entire HSS system within 266 days. - Number of shipments of Contract shall be no more than five (05) shipments. The delivery plan of Contract shall be in line with the Project Schedule at APPENDIX 2- Time Schedule of Chapter V to this Contract. - In case the number of the shipments of Contract exceeds five (05) shipments due to reasons solely attributed by the Foreign Contractor, all arising expenses for receiving the goods including storage charges, customs clearance fees, transportations to Buyer's storage etc. shall be borne by the Foreign Contractor. - The Local Contractor shall be responsible for the import cost (including but not limited to custom fee, import tax, storage fee.) for the value gap only in accordance with CIP/CIF term if the of Contract value of all shipments exceed the Total Price Net of Contract as stipulated in the Contract. - The transfer of title of equipment between Contractor and Buyer/End-User: + Title of Hardware and Spare Parts of Foreign Part supplied by Foreign Contractor shall pass to the Buyer/End-User upon the Foreign Supplier's transfer of the Hardware and Spare Parts to the Buyer/End-User at the arrival airport/seaport in Vietnam. Foreign Bidder/Seller shall be responsible for the Foreign Part and shall bear the risk of loss and damage thereto in accordance with the Incoterms used. + Title of Hardware of Local Part supplied by Local Contractor shall be transferred to the End-User when the Overall Delivery Acceptance Certificate (Overall DAC) signed by the Parties.

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	- If the Buyer discovers any loss or shortage of the Supplies in comparison with Invoices and Packing list, the Buyer shall inform the status of cargos to the Parties in according with the Insurance Law of Viet nam to establish the survey report at spot. This survey report shall be the legal document in case of dispute and determine actual state of the Supplies, claim formalities. If deficiencies or missing of the Supplies is solely attributed to the Contractor's responsibility, the Contractor must replace the shortage and remedy the Supplies without delay at his own costs. If the minor due to transport, the Contractor and the Buyer shall set immediately complaining letter requiring the Insurance company for compensation. <u>*If the Contractor fails to deliver the Supplies as stipulated in the Contract, the Contractor shall pay a liquidated damage that mentioned at Article 22 this Chapter.</u> - The delivery of the supplies shall be carried out by the Contractor to End-User's Project Sites. - Delivery place: End-User's Project Sites in Viet Nam (Installation site). - Delivery term: Delivered At Place (DAP) to End-User's Project Sites in accordance with INCOTERMS 2010 issued by ICC. - The Contractor shall be responsible for hiring air transportation/ship transportation to Vietnam airport/seaport in Vietnam according to Delivered At Place. In which: + Foreign Part supplied by Contractor: DAP to Vietnam port/airport. Local Contractor shall be responsible for transportation and insurance thereof for the Foreign Part from Vietnam port/airport to End-User's Project Sites, insurance during the process installation, integration and commissioning to the date of PAC. + Local Part supplied by Local Contractor: DDP to End-User's Project Sites. + Other Responsibilities as specified in the main Contract. - The Local Contractor shall pay the terminal handling charge (THC), container imbalance charge (CIC) or equipment imbalance surcharge, the lift on/lift off charges, container cleaning fees and other port/airport charges at the airport/seaport of destination in Vietnam. - The Local Contractor shall pay storage fees which is only due to the fault of Contractor and/or Freight forwarder of Contractor arising at the seaport/airport of destination in Vietnam. The Contractor shall pay these fees to the related third parties. The Contractor shall bear all costs accrued due to the delay of sending their representative to pay the related fees at the sea/airport of destination. - If the Buyer finds out that all losses, good missing with respect to the Invoices and Packing lists, the Buyer shall inform the status of cargos to the Contractor and the Contractor shall immediately request the Insurance company (specify the name of Company) to make a report on site. This report shall be legal evidence in case of disputes in defining equipment/goods status and shall be a basic for complaining.

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	• If the minor due to transport, the Contractor and the Buyer will send immediately complaining letter requiring the Insurance company to compensate. If deficiencies or goods missing are only attributable to the Contractor, the Contractor shall be responsible for replacing, remedying at the Contractor's cost failing such, the Buyer has the right to: - For the Local Part: Deduct from Total Contract Price payable to the Local Contractor or claim the amount from Performance Security; and/or Local Contractor shall pay such amount by T/T to the Buyer's account within thirty (30) days from the date of the Buyer's request. - For the Foreign Part: Claim the Foreign Contractor to pay compensation, the Foreign Contractor shall pay such amount by bank transfer to the Buyer's account within thirty (30) days from the date of the Buyer's request or claim the amount from Performance Security. • <i>The time implementation of Contract:</i> + The time for installation, setup, configuration, system integration, technical acceptance testing (ATP), and issuance of the Provisional Acceptance Certificate (PAC) is 280 days from the Contract Effective Date (266 days for technical acceptance + 14 days for completing documentation and issuing the PAC). + <i>For Network stabilization 60 days from the PAC Date</i> + <i>For FAC issuing:</i> within 25 days after the Contractor' presentation of the Certificate of Network stabilization completion. • <u>Other requirements:</u> - <i>Spare Parts:</i> + The Contractor must supply the spare parts of the Supplies which are compatible in form, fit and function or a period of five (07) years from the FAC be signed date. The price of spare parts will be negotiated between the Buyer and the Contractor but should not be higher than the discounted price of the Contract. + Replacement parts shall fit to the requirements specified in Part 2 - Requirements on the scope of supplying. - <i>Provisional Acceptance Certificate (PAC) of Contract:</i> + The time for installation, setup, configuration, system integration, technical acceptance testing (ATP), and issuance of the Provisional Acceptance Certificate (PAC) is 280 days from the Contract Effective Date (266 days for technical acceptance + 14 days for completing documentation and issuing the PAC). . In which: + Fifteen (15) days prior to the Date of Completion of the installation and commissioning, the Contractor shall submit the Buyer a written letter notifying that the System/Part of System or Site is ready for acceptance. The Buyer and the End-user shall have the right to carry out acceptance tests under the supervision of the Contractor's experts in accordance with the acceptance test procedures and test schedule as agreed by the

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	Contractor and the End-user and based on relevant international standards. + Expenses for inspection of goods (measuring instrument, tool for testing, experts ...) shall be borne by the Contractor. + Methods for unsatisfactory good under inspection and testing: For unsatisfactory goods of the inspection and test, the Contractor must receive these equipments and bear all reimbursement of the related costs to the Buyer/End-User. + If the test results indicate compliance with the technical Specifications, and the Buyer is satisfied and the outstanding minor defects/deficiencies (if any) will not affect operation of the System, the system successfully cutover without major issues, the <i>Acceptance test procedure (ATP)</i> shall be signed by the Contractor, the Buyer and End-User. + The Contractor and the Buyer/End-User will honor their respective areas of responsibility as defined in the Annex 6-Responsibility Matrix. If project is delayed due to reasons attributed to the Buyer/End-User such as the delayed corresponding site and transmission are not ready, etc. the project time plan will be extended accordingly. + PAC will be issued <i>within two weeks after the</i> Contractor' presentation of ATP and certificate of technical acceptance. + A list of any minor defects or deficiencies not affecting the operation of the System or Site shall be attached to the PAC and shall be corrected by the Contractor, at no cost to the Buyer, prior to the FAC Date. - Network stabilization period: The Network stabilization shall commence on the PAC date of Contract and shall be considered to be complete within 60 days from the PAC date for all Project Sites, the System is in continuous and well operation and the minor defects stated in the PAC have been corrected/adjusted in compliance with the specifications, and the Service has been completed in accordance with the Contract. When the Network stabilization has been finished as strictly specified in this article and Work has completed as strictly specified in the Contract, a Certificate of Network stabilization completion shall be signed by the Buyer, End-User, Foreign Contractor and Local Contractor within seven (07) working days. The Bidder shall make their experts available during the whole Network stabilization to remedy faults, at no cost to the Buyer/End-User. - Final Acceptance Certificate of Contract: Final Acceptance Certificate (FAC) of Contract shall be granted by the Buyer and End-user when the Network stabilization has been finished as strictly specified in the Article 20 and Work has completed, certified by Buyer as strictly specified in the Contract. FAC shall be issued upon the Contractor' presentation of PAC and Certificate of Network stabilization completion. FAC shall be signed by

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	the Contractor, the Buyer and End-User within 25 days. In case the Final Acceptance Certificate (FAC) of Contract is not issued within thirty (30) days after the Certificate of Network Stabilization Completion due to the reason solely attributable to the Buyer/End-User, the Final Acceptance Certificate (FAC) of Contract shall be deemed automatically issued to the Bidder. A similarly relevant document from the Bidder will legally substitute the Final Acceptance Certificate (FAC) of Contract. The Article GCC 23 (Warranty) will then be applied. The Date of Final Acceptance Certificate (FAC) of Contract is the date of Network Stabilization Completion for all Project Sites of Contract which are specified in the Certificate of Network Stabilization Completion. - Technical Services: a) To carry out the installation on site, commissioning the machinery and equipment provided; b) Provide the necessary tools for assembly and maintenance of machinery and equipment is provided; c) Provide detailed guidance document on the operation and maintenance for each type of equipment is provided; d) perform or supervise the maintenance and repair of the machinery and equipment provided; e) Training personally for the end-user about the installation, commissioning, operation, maintenance and repair of machinery and equipment is provided; f) Other matters as agreed by the Parties (if any).
GCC 21.1	<i>Factory Inspection and Test:</i> 1. Factory inspection and Test of the Supplies shall be conducted by the Manufacturer before shipments to ensure a successful performance when installed Certificate of Quality shall be sent to the Buyer together with the shipping documents. 2. Preliminary examination: The Buyer/ End-user shall preliminarily check and examine on the quantity and packaging of the goods at the place of delivery in the presence of Bidder. If there are any evidences for the damage of the goods, Bidder must have responsibility to replace those damaged goods. Based on preliminary test results, if the goods are delivered in sufficient quantities under contract, no evidences of deterioration or defect, the Purchaser and the Bidder will sign The Protocol of delivery and receiving Equipment. 3. For unsatisfactory goods: For unsatisfactory goods of the inspection and test, the Bidder shall provide qualified goods to replace. After the replacement, the equipments are materially not compliance with the technical specification specified in the Contract, the Bidder shall get back

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	the equipments, reimburse for all related direct expenses to the Buyer and pay liquidated damages as stipulated in the Article 22 of SCC. 4. Other requirements - The Contractor shall at its own expense and at no cost to the End-user carry out all such tests and/or inspections of the Equipment, Software/Software Right to Use and Related Services. - Whenever the Contractor are ready to carry out any such test and inspection, it shall give a reasonable advance notice, including the place and time, to the End-user. The Contractor shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the End-user or its designated representative to attend the test and/or inspection. - The Contractor shall provide the End-user with a report of the result of any such test and/or inspection. - The End-user may reject any Equipment, Software/ Software Right to Use or any part thereof that fail to pass any test and/or inspection or do not conform the specifications. The Contractor shall either rectify or replace such rejected Equipment, Software/ Software Right to Use or parts thereof or make alterations necessary to meet the specifications at no cost to the End-user, and shall repeat the test and/or inspection, at no cost to the End-user, upon giving a notice. - The Contractor agree that neither the execution of a test and/or inspection of the Equipment, Software/ Software Right to Use or parts thereof, nor the attendance by the End-user or its representative, nor the issue of any report, shall release the Contractor from any warranties or other obligations under the Contract.
GCC 22	1. Liquidated Damages: Applicable. In case liquidated damages are applied, the provisions are as follows: Except for Force Majeure events as stipulated in Clause 26 of the GCC, if the Contractor fails to provide the related services within the time for completion specified in the Contract, the Employer may deduct from the Contract Price an amount of liquidated damages corresponding to: 1% of the value of the delayed portion of related services per week of delay until such services are actually performed. The total amount of liquidated damages shall be capped at 8% of the value of the violated contractual obligation portion. Once the maximum penalty is reached, the Employer may consider terminating the Contract in accordance with Clause 29 of the GCC. Detailed provisions: - The penalty for delay in providing services (installation, configuration, integration, ATP testing, etc., until the technical acceptance of the entire system) shall be 1% of the value of the delayed services per week of delay; in the event that such delay in service provision (installation, configuration, integration, ATP testing, etc., until the technical acceptance

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	of the entire system) causes impacts leading to the inability to conduct technical acceptance for the entire system under the contract, the penalty shall be 1% of the aggregate value of both services and goods (inclusive of VAT) affected by such delay per week of delay . - In the case of incomplete weeks, it is calculated as follows: Number of delayed weeks = t + (number of incomplete days/ 7), where t is the number of full 7-day weeks. - This amount shall be the Contractor' sole responsibilities due to the delay. The Buyer may claim the compensation for any such amount. Upon the Buyer/End-User and the Contractor' written agreement, the Contractor shall pay such amount by bank transfer to the Buyer's account within thirty (30) days from the date of the Buyer's request; failing such, the Buyer may claim the amount from any Security deposited by the Contractor the Buyer under the Contract. - In case the Buyer decides to claim the amount from any Security deposited by the Contractor to the Buyer under the Contract, the Buyer will inform the Contractor in writing about the claim within 15 days before sending the claim to the bank. - All direct losses, costs, charges, expenses which the Buyer shall have incurred by reason of any faults or mistakes solely attributable to the Contractor during the performance of the Contract referred to in this Article shall be mutually agreed by all parties together with any liquidated damages sum payable to the Buyer under the Contract, shall be paid in the manner of bank transfer. The Contractor shall pay the agreed liquidated damages to the Buyer by bank transfer within thirty (30) days from the receipt date of the Buyer's invoice and payment request which is supported by legal documentary evidence of such losses, costs, charges, expenses such as invoices and other vouchers issued by customs and relevant authorities. If the Contractor fails to transfer the compensation amount as stipulated time, the Buyer shall claim the amount from any Security deposited by the Contractor to the Buyer under the Contract. For the avoidance of doubt the Buyer shall be the sole beneficiary for Liquidated Damages under this Contract. 2. Compensation for Damages: Applicable. Compensation for damages shall be determined based on the full actual losses incurred.

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GCC 23.1	The Goods shall be brand new, unused, not end of sale and end of life, quality assurance and manufacturing standards will not have defects lead to disadvantages arising during use Goods, works well, ensuring compatibility, synchronization, complete, compatible with the current system of VNPT Net, exploitation, the right type and complied with the Technical Specifications of the Contract. - Goods will be provided with full documentation attached including but not limited to the design, catalogs, drawings, charts, manuals and installation instructions, maintenance and safety instructions as applicable.
GCC 23.3	Requirements on warranty: - Warranty bond: Within ten (10) working days after the parties sign the FAC of Contract, the Contractor shall submit to End-User one original of warranty bond for their respective portion on the Contract valid up to twenty five (25) months from the date of FAC of Contract. The value of warranty bond is ten percent (10%) of the Total Contract Price. The Warranty bond shall be issued by a well-known bank in Vietnam or a foreign Bank's branch in Vietnam approved by the Buyer and issued in Vietnamese and English languages by way of an unconditional and irrevocable bank guarantee in a form acceptable to the End-User/Buyer (follow the template 03 of this Contract). Upon the relevant expiry date(s) of the Warranty Bond, the said bond(s) issued under this Contract shall become null and void, whether returned to the Contractor for cancellation or not and any claim or statement received on or after the said expiry date(s) shall be ineffective. - The beneficiary of Warranty bond: VNPT Net Corporation + Account VND:1006153688 Bank name: Saigon – Hanoi Commercial Joint Stock Bank (SHB)- The Hanoi branch + Account USD:1006203567 Bank name: Saigon – Hanoi Commercial Joint Stock Bank (SHB)- The Hanoi branch - The Warranty Period: The Warranty Period of Twenty four (24) months for the proposed systems counting from the date of issuing FAC of Contract: - Warranty Location: in the place where the equipment handed over or by agreement between the two parties. - Others: + Notwithstanding that the Work has been accepted by the Buyer, the Contractor shall warrant that the system shall operate in accordance

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	with the Technical Specifications under the Contract including the installed software which will perform in accordance with the Associated Documentation; + The Contractor further warrants that the Supplies shall be free from defects arising from any act or omission of the Contractor or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination. + Any corrected or replaced Software shall be warranted for the remainder of the original warranty period or twelve (12) months from the date of such software's correction or replacement whichever comes later. + During the Warranty Period if any defects or failure occur, the Buyer/End-User shall notify the Contractor immediately of such defects and failures and the Contractor shall, without undue delay, and without any charge to the Buyer/End-User, replace and repair in order not to affect commercial operation of the Buyer/End-User. The Contractor undertakes to always take the necessary actions to remedy defects at the soonest possible time; + In case the Supplies should be repaired and/or replaced, within seven (07) days from date of notification, the Contractor shall inform the Buyer of the estimated period for repair/replace, which shall not be later than sixty (60) days from the dispatch; If the Contractor fails to commence the work necessary to remedy such defect or any damage to the System caused by such defect within the time period mention above, the Contractor shall bear all arising costs, expensed and delay penalty as specified in Article 22 of SCC due to this delay. Such liquidated amount shall be paid by bank transfer from the Contractor to the Buyer's account within 30 days from the date of Buyer's Payment request. This method of payment by T/T shall be the first priority by the Parties. If the Contractor fails to transfer the funds within 30 days from the claim date, the Buyer/End-User shall do procedures to withdraw such total amount from the valid Performance Security or valid Warranty Security. Upon the Contractor's receipt of the faulty Supplies from the Buyer/End-User, if the faulty Supplies dispatched for repair/replacement are not returned within the above – mentioned period of time (except for force majeure as hurricanes, floods, natural disasters), the Contractor shall bear all direct costs and expenses incurred by the End-User in arranging for alternative supplies with equivalent functionality based on the written agreement by the Parties. The Buyer/End-User shall provide the legal documentary evidence for such costs and expenses such as financial invoices and other vouchers issued by customs and relevant authorities.

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	+ All fees related to the repair and replacement shall be at the Contractor's cost including but not limited to items as following: a) Transportation charge from the Buyer's/End-User's Site to the Manufacturer's repair Center. b) Repair/replacement costs c) Cost necessary for shipping out the repaired parts from Manufacturer's repair site. d) Other related costs for repair/replacement export and import taxes. + In case the Supplies dispatched for repair/replacement shall not be returned within the stipulated time, Contractor shall bear all direct costs and expenses incurred by the End-User in arranging for alternative supplies with equivalent functionality based on a written agreement by the Parties to be delivered and such End-User's costs & expenses must be supported by legal documentary evidence such as invoices and other vouchers issued by customs and relevant authorities. + The Contractor warrants that any replacement or repaired Supplies provided under warranty period shall be warranted for twelve (12) months from the date of repair of replacement or the expiry date of the Warranty period, whichever comes later; + The Contractor shall not be liable for any defect or damage caused by faulty or inadequate operation of the Buyer; + The Contractor may, at any time, with the Buyer's written consent in advance, introduce into the System technical modifications which become necessary due to changes in technology and/or availability of components, provided that the performance of the replaced Supplies is functionally equivalent or better than the performance of Supplies specified in this Contract, and compatible with it; + If at the expiry of Warranty Period after repair and/or replacement the Supplies do not materially conform to the Technical Specifications, the Buyer shall return the defective Supplies to the Contractor and the Contractor shall reimburse the respective paid amount and related fees upon the invoices presented by the Buyer; + Upon the Buyer/End-User and the Contractor' written agreement, the Contractor shall pay such amount by bank transfer to the Buyer's account within thirty (30) days from the date of the Buyer's request; failing such, the Buyer may claim the amount from any Security deposited by the Contractor with the Buyer under the Contract provided that the Buyer has to inform the Contractor in writing about the claim 15 days before sending the claim to the bank. + At any time before the expiry date of the Warranty Period, if the End-User finds that any Supplies of System are not in compliance with the

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	Specifications of the Contract or defective for the reasons which are solely attributable to the Contractor, the End-User has the right to seek resource and in the event that such non-compliance or defect is not rectified by the Contractor, End-user may reject such Supplies notwithstanding before that, the End-User may have been satisfied and accepted these Supplies and that payment may have been settled in respect of such Supplies. In this case the Contractor shall, at its own costs, replace such Supplies with Supplies that conform with the Specification. - Requests after the warranty period: + The Contractor shall make repair and replacement services for the materials and equipment supplied under this Contract available (even after contract expire) during the 05 years from the expiry date of the warranty period. In case the Buyer/End-User decide to purchase repair and replacement services, the unit price for spare parts and repair services shall be negotiated and agreed between the Parties, however, the unit price of the equipment will not be higher than the unit price in the contract and the price is not higher than the price in the market for new equipment which is not shown in this contract in 5 (five) years from the expiry date of the warranty. + The Contractor is responsible for providing the full information of: (i) after-sales support (support for troubleshooting, repair services, replacement); (ii) technical support service and; (iii) repair by producer for the main equipment; + After the warranty period, the cost of repair services, replacement and troubleshooting assistance is subject to a separate agreement between the Parties, - Maintenance: The Contractor shall provide process of equipment maintenance and this process must be ensured compliance with the current regulations on quality management and maintenance works.
GCC 27.7 (d)	In case the proposal of a cost-saving solution is approved by The Employer and helps to reduce the contract price, The Employer shall pay the Contractor 0% of the contract price reduction value.
GCC 27.8	Other content on adjustment, supplement of contract: - No modification, amendment or other changes may be made to this Contract or any part thereof unless reduced to writing and executed by authorized representatives of both Parties; - Any variation and/or amendment to this Contract shall be valid only after duly signed by authorized representatives of both Parties and shall be an integral part of the Contract; - The correspondences between both Parties regarding this Contract shall be in the English language or Vietnamese language.
GCC 29.1	c. Other action:

Item	Content
	(i) Neither the Contractor or the End-user/Buyer shall terminate or suspend performance, in whole or in part, without the other party's prior written consent, provided that the terminating party should grant the other party a reasonable period of sixty (60) days to rectify the discrepancies that bring to the non-performance of this Contract, before the terminating party may terminate the whole or any part of this Contract. After this period, if the defaulting party still fails to perform substantially its obligations, the terminating party may terminate this Contract by serving a written notice to the other party. (ii) Upon termination due to the Contractor's fault, the End-user/Buyer is entitled to draw certain amount to recover its damages but not exceeding the total Contract value. The End-user/Buyer shall return the Supplies, which fails to meet specifications agreed upon and identified for such Supplies as per Annex 1- Price List to the Contractor without compensation for those expenses incurred by the Contractor in the provision of said Supplies. The Contractor shall reimburse the End-user/Buyer all money received from the End-user/Buyer for the returned Supplies at the time of termination. Transportation costs and other costs for returning the Supplies shall be borne by the Contractor. (iii) Upon termination due to the End-user/Buyer's fault, the parties hereto shall agree upon and certify the portion of the Work which has been performed by the Contractor under this Contract by the date of termination. The Contractor shall be entitled to receive payment from the End-user/Buyer for this part of the work executed. (iv) Any party may terminate this Contract immediately by written notice to the other party if any party becomes insolvent, makes a general assignment for the benefit of its creditors, suffers or permits the appointment of a receiver over its business or assets, becomes subject to any proceedings under any bankruptcy or insolvency law whether domestic or foreign, either voluntarily or otherwise. (v) Either party shall not be in default if any failure to perform its obligations accordance with this Contract arises out of Force Majeure as per Article 26 of GCC. (vi). On termination of this Contract any other parts of this Contract that, by their nature, are intended to survive termination will do so.

Chapter VIII. Contract Forms

Form No.21. Notification of bid acceptance and contract award

NOTIFICATION OF BID ACCEPTANCE CONTRACT AWARD

[Location] _____, [date] _____

To: _____ *[insert name and address of the successful Bidder, hereinafter referred to as "the Supplier"]*

Re: Notification of bid acceptance and contract award

Pursuant to Decision No. _____ dated _____ of the Purchaser *[insert the Purchaser' name]*, (hereinafter referred to as "the Purchaser") in terms of approval for result of selection of contractor for _____ *[insert name of procurement]*, the Procuring Entity _____ *[insert name of Procuring Entity, hereinafter referred to as the Procuring Entity]* would like to inform that the Purchaser accepts the bid and awards the Contract to the Supplier for _____ *[insert name and ID number of procurement. If the procurement is divided into several lots, state the name and ID number of the lot(s) awarded to the Supplier]* with the Contract Price: _____ *insert the successful bid as specified in the Decision of approval for the bidder selection result]* and within: _____ *[insert the Contract duration as specified in the Decision of approval for the bidder selection]*.

We therefore request the legal representative of the Supplier to enter into finalization and conclusion of the Contract with the Purchaser and the Procuring Entity according to the following plan:

- Time for the Contract finalization: _____, in/at _____ *[location]*;
- Time for the Contract conclusion: _____, in/at _____; enclosed with the Draft Contract.

The Supplier is requested to undertake the Performance Security as prescribed in form No. 23 of Chapter VIII - Contract Forms included in the invitation for bid with an amount of _____ and valid time _____ *[as specified in SCC Article 5.1 of the Bidding documents]*.

This Notification is an integral part of the Contract. Upon the receipt of this Notification, the Supplier must send us a notification of acceptance of contract finalization and contract conclusion, and take measures of performance security as required, in which the Supplier must undertake that its current capabilities are still responsive to requirements set forth in the BD. If the Purchaser detect that the current capacity of the Supplier fails to satisfy the requirements of the procurement, it shall refuse to finalize and conclude the contract with the Supplier.

If by the date __ (1), the Supplier fails to conclude or refuse to conclude the Contract or

carry out the Performance Security in conformity with the above requirements, the Supplier shall be rejected and shall not have its bid security returned.

Legal representative of the procuring entity
[full name, position, signature and stamp]

Enclosed: Draft Contract.

- (1) Insert an appropriate date in line with the time limit set forth in the Bank Guarantee

CONTRACT FORMS

CONTRACT

Contract No:

For package

of the project:

Contract No.: _____

Procurement package:

Under Project:

Where as,

- Pursuant to Public Procurement Law No 22/2023/QH15; Law No 57/2024/QH15; Law No 90/2025/QD15 issued by the Government making detailed provisions for implementation of the Law on Bidding for selection Bidder

- Pursuant to

- Pursuant to Decision No. / QD-VNPT Net-KHDT-KT dated / / regarding the approval of the bidding result of the bidding package “.....” and the notification on bid award number / dated / / of the Procuring Entity;

- Pursuant to the protocol of contract negotiation signed by Procuring Entity and the winning bidder on dated month year ;

- Pursuant to the bidding documents and clarification of bidding documents of the winning bidder;

We represent the parties signing the Contract, including:

Investment Owner: VNPT NET CORPORATION (VNPT NET)

Address:

Phone:

Fax:

Email:

Account:

Tax code:

Represented by Mr./Mrs.

Title:

Power of Attorney is signed on -----

(in case of delegation)

(Herein after called “Employer Owner” [or “Buyer” and the End-User] or “A”) includes inheriting, beneficiary Company, is the first party, and

_____, a company established in
_____ which head office situated at _____

Phone:

Fax:

Email:

Account:

Tax code:

Represented by Mr./Mrs.

Title:

Power of Attorney is signed on

(in case of delegation)

(Herein after called “Bidder” [or “Bidder” or “B”]) includes inheriting, beneficiary Company, is the second party,

The Buyer, the End-User and the Bidder shall be collectively referred to as “Parties” and individually referred to as “Party” as the context may require.

The Parties (Buyer and Bidder) agree to sign the Contract for package “.....” of the project: “.....”

NOW THE DETAILS OF THIS AGREEMENT ARE AS FOLLOWS:

1. Subject of contract:

Party A Requests Party B to supply the Goods and related Services which are requested in details of the attached Annexes.

2. Contract components

The components of the Contract include the following, in order of legal priority:

1. The contract (together with Specific Conditions of Contract and General Conditions of Contract)
2. The contract’s Annexes
3. The protocol of negotiation and completing contract;

4. Proposals prepared by Bidder and all document of clarifying the proposal of the Bidder (if any)
5. The approval decision of Bidder selection result;
6. Request For Proposal (RFP) and all documents of Clarification and amendment requested of RFP (if any);
7. Other documents (if any)

3. Responsibilities of the Buyer:

3.1. The Buyer commits to pay the Contractor the Contract Price Net specified in Article 5 of this contract following the payment term specified in the Special Conditions of Contract, as well as fulfil all other obligations and responsibilities specified in the Special Conditions of Contract and General Conditions of Contract.

3.2. Other Responsibilities:

3.2.1. The Buyer shall execute all procedures necessary for the payment stated in the Article 5 in this Contract.

3.2.2. The Buyer shall be responsible for customs clearance for Foreign Part supplied by Foreign Contractor within seven (07) days from the Buyer's receipt date of arrival notice of complete shipment issued by Vietnam transportation agent against the correct full set of shipping documents for each shipment sent to the Buyer as defined in the Articles 9 of SCC and the number of procedures (originals and copies) are specified in the Articles 14.2 of SCC in the Contract. The Buyer shall hand-over the Foreign Part to the Local Contractor at Vietnam seaport/airport for the local transportation to End-User's Project Sites.

3.2.3. The Buyer shall be responsible for paying import tax, VAT and all related fees during import procedure (exclude fee as stated in the Articles 4.8 and 4.9).

3.2.4. Upon completion of customs clearance at seaport/airport, the Buyer shall immediately handover the equipment back to the Local Contractor

3.2.5. The Buyer shall be responsible for obtaining type approval, import license to import the equipment as per Annex 4- Implementation Schedule.

3.2.6. In case of failure or delay of the Buyer to fulfill these above obligations, the Implementation Schedule shall be extended accordingly.

3.2.7. The Buyer shall withhold the Corporate Income Tax of Foreign Contractor Withholding Tax amounting to USD (In words:) from the Total Contract Price of the Foreign Part amount and shall be responsible for this tax payment to the Vietnam State Budget on behalf of the Foreign Contractor.

3.2.8. The Buyer shall provide one (01) copy of Certificate of Corporate Income Tax payment in Vietnam issued by Vietnamese Tax Authorities to the Foreign

Contractor within sixty (60) days from the date of the tax payment.

4. Responsibilities of the Contractor

The Contractor commit to supply the Goods specified in Article 1 of this contract; as well as fulfil all other obligations and responsibilities specified in the Special Conditions of Contract and General Conditions of Contract.

The detailed responsibilities of Foreign Contractor and Local Contractor are defined in the Annex 6- Responsibilities Matrix and Annex 3- Solution Description.

4.1. The Contractor shall supply the Hardware, Spare Parts, Software, Software License for the Right to Use and Services as referred in the Annex 1- Price List on the basis of DAP to End-User's Project Sites in Vietnam in accordance with the terms and conditions of INCOTERMS 2010, in which:

- The Foreign Contractor shall supply the Hardware, Spare Parts, Software and Software License for the Right to Use and as referred in the Annex 1- Price List on the basis of CIP/CIF to Vietnam seaport/airport in accordance with the terms and conditions of INCOTERMS 2010;

- The Local Contractor shall be responsible for transportation (include loading/unloading and warehouse) and insurance thereof for the Hardware, Spare Parts from the Vietnam port/airport to the End-user's Project Site where the Hardware is to be installed.

4.2. The Local Contractor shall provide the technical services as stipulated in the Annex 3- Solution Description of the Contract.

4.3. The Supplies delivered shall be brand-new, free of defective material and complied with the technical specifications of the Contract. The Contractor shall insure the interconnection of the supplied system to the existing nodes of End-user's network in compliance with the related technical specifications.

4.4. The Contractor shall conform to the Statement of Compliance attached hereto as Annex 2- State of Compliance for Scope of Supply and Compliance for Technical Requirements - and implement successfully all system functions as described in Annex 3- Solution Description.

4.5. The Foreign Contractor shall be responsible for hiring air and/or sea transportation to Vietnam according to CIP/CIF to Vietnam airport/seaport in accordance with the terms and conditions of INCOTERMS 2010.

- The Local Contractor shall pay storage fees which is only attributable to the Contractor's responsibilities at Vietnam airport/seaport of destination. The Local Contractor shall pay directly these fees to the related third party.

4.6. The Local Contractor shall pay the terminal handling charge (THC), container imbalance charge (CIC) or equipment imbalance surcharge, the lift on/lift off

charges, container cleaning fees and other port/airport charges (except arising charges due to the fault of Buyer) at Vietnam airport/seaport of destination. The Local Contractor shall pay directly these fees to the related third party.

Within one (01) working day since the Buyer's notification informs that the customs declaration at the port/airport of destination have been completed and the Hardware, Spare Parts and Software are ready for local transportation, the Local Contractor will send their representative to the port/airport of destination to pay directly all the fees mentioned in articles 4.6 and 4.7 to the related third parties. Local Contractor shall bear all costs accrued due to the delay of sending their representative to pay the related fees as mentioned in articles 4.6 and 4.7 at the seaport/airport of destination.

4.7. Within one (01) working day since the Buyer's notification informs that customs declaration at the port/airport of destination have been completed and the Hardware, Spare Parts and Software are ready for local transportation, the Local Contractor will send their representative to the port/airport of destination and coordinate with the Buyer's representative to receive the completed customs declaration and other documents in order to receive the Hardware, Spare Parts, Software and Software RTU.

Local Contractor shall bear all costs accrued due to the delay of sending their representative to receive the Hardware, Spare Parts, Software and Software RTU at the seaport/airport of destination.

The Hand-over Certificate (HOC) of each shipment shall be signed by the Local Contractor, Buyer and End-User certifying that all the Hardware, Spare Parts and Software of each shipment has been delivered to the Local Contractor at the seaport/airport of destination.

4.8. The Foreign Contractor shall be responsible for insurance of goods of all types according to insurance conditions ALL RISKS, WAR, SRCC, covering 110% of invoice value showing Contract number, shipment number and/or invoice number and payable in Vietnam with respect to every risk occurred in international transportation to the port of discharge.

4.9. The Local Contractor shall be responsible for insurance of goods of all types inside Vietnam with respect to all risk occurred in local transportation and during the process of installation, integration and commissioning to the date of PAC.

4.10. The Foreign Contractor shall, within fifteen (15) days after Contract Effective Date, be responsible for providing:

- One original of all relevant documents, technical specification in English including descriptions, user's guide, image of products, testing results issued by one organization in the "List of Competent Organizations to issue the test result for Type

Approval” issued by Ministry of Information and Communications of the S.R Vietnam to enable the Buyer to apply for the Type Approval and/or Declaration of Conformity for the Supplies;

- Three (03) originals Pro-formal Invoice signed by Foreign Contractor for 100% the Price Net of the Foreign Part including: Hardware, Software, Software Right To Use and Spare Part supplied by Foreign Contractor for the Import License for the Supplies.

4.11. The Foreign Contractor shall be responsible to bear the Corporate Income Tax part of the Foreign Contract Withholding Tax. The Investment Owner will be keep for this tax amount for payment on behalf of the Contractor, the Foreign Contractor shall provide relevant Invoices of CIT part (which issued and signed by the Foreign Contractor) in three (03) originals to the Buyer.

4.12. The Foreign Contractor shall be responsible for obtaining and maintaining necessary permits, licenses and visas etc. that may be required for Foreign Contractor’s personnel to travel and stay in Vietnam in order to implement this Contract in accordance with the Vietnamese Government’s Decree 46/2011-NDCP.

4.13. Within one (01) working day since the Local Contractor’s notice in writing to the End-User that all the Hardware, Spare Parts, Software and Software RTU of each shipment have been transported to the End-user’s Project Sites, the End-User will send their representative to the End-user’s Project Sites and co-ordinate with Local and Foreign Contractor’s representative to check the number of cases of each shipment (Compare with related shipping invoice, Bill of Lading and/or Airway Bill and Packing List). The Delivery Acceptance Certificate (DAC) of each shipment shall be signed by the End-User and the Contractor certify that all the Hardware, Spare Parts and Software of each shipment were delivered to the End-user’s Project Sites by the Contractor.

4.14. Within thirty (30) days after the date of the last Equipment record at site, against Contractor’ presentation to Buyer of:

- The full set of Delivery Acceptance Certificate;
- Shipping documents of all shipments.

The Overall Delivery Acceptance Certificate (Overall DAC) will be issued, signed and sealed by the Buyer, End-User, the Contractor and Local Contractor certify that all Hardware, Spare Parts and Software of Foreign Part of this Contract were delivered to the End-User’s Project Sites.

4.15. Five (05) working days before the date of the Foreign Contractor’s presentation of payment documents of each payment under the Letter of Credit to the advising bank, the Foreign Contractor shall send directly to the Buyer the following documents:

- One original letter of notification for the payment content signed by the Foreign Contractor;

- One copy of the official signed commercial invoices for payable amount of each payment as specified in the Article 14.2, term 14.2.1, item b of SCC of Contract.

4.16. After signing date of this contract, within seven (07) working days from the receiving date of the Buyer's written requirement, the Foreign Contractor shall provide all relevant documents to enable the Buyer to apply for the necessary licenses for the Supplies of this contract from Vietnamese Authorities in accordance with the Laws and Regulations of Vietnam (if any).

4.17. The Contractor shall provide the Buyer with a notarized Vietnamese translation of this main Contract and related Price Annexes.

5. Contract Price and Terms of payment

5.1. The Total Contract Price is USD.... (In words: United States Dollars) and/or VND... (In words: Vietnamese Dong);

The Total Contract Price consists of the Foreign Part and Local Part Plus Corporate Income Tax portion of the Foreign Contractor Withholding Tax (excluding Value Added Tax of the Foreign Contractor Withholding Tax) and Value Added Tax subjected to Local Services portion of the Local Part.

The Contract Price of the Foreign Part plus CIT portion of FCWT is USD (In words: United States Dollars) and the Contract Price of the Local Part (VAT excluded) is VND (In words, Vietnamese Dong), of which:

* The Contract Price Net amounts to USD and VND (In words: United States Dollars and Vietnamese Dong).

* The Corporate Income Tax portion (CIT) of Foreign Contractor Withholding Tax amounts to..... (says.....)

* Value Added Tax (VAT) shall be added on the VAT Invoices for Local Part supplied by Local Contractor equal to VND (In words:). The Value Added Tax (VAT) is ten percent (10%) in accordance with the Laws and Regulations of Vietnam.

5.1.1. The Contract Price Net includes:

5.1.1.1. Foreign Contractor

The Contract Price Net for Foreign Part supplied by Foreign Contractor on the basis of DAP to Vietnam airport/seaport in accordance with the terms and conditions of INCOTERMS 2010 is: USD of which:

+ The Price Net of the Hardware (including the freight and insurance): USD

+ The Price Net of Software and Software Right To Use: USD

Price Net of Contract for Foreign Part supplied by Contractor consists of (i) The Price Net of the Hardware (including the freight and insurance) and (ii) The Price Net of Software and Software Right To Use.

5.1.1.2. Local Contractor (if any):

The Contract Price Net for Local Part supplied by Local Contractor on the basis of DDP to the End-User's Project Sites (installation site) in accordance with the terms and conditions of INCOTERMS 2010 is: VND , of which:

+ The Price Net of the Hardware: VND

+ The Price Net of the Local Services: VND

Price Net of Contract for Local Part supplied by Contractor consists of (i) The Price Net of the Hardware and (ii) The Price Net of Services and Training.

5.1.2. The CIT amount of Foreign Contractor Withholding Tax which will be calculated according to circular 103/2014/TT-BTC dated on 6/8/2014. This amount of Tax shall be withheld by the Buyer to pay to Tax authorization in Vietnam and consists of:

+ Corporate Income Tax (CIT) imposed on the Hardware:

+ Corporate Income Tax (CIT) imposed on Software (SW) & Software Right To Use (RTU):

+ Corporate Income Tax (CIT) imposed on Services:

5.2. Terms of payment

5.2.1. Currency of this Contract shall be calculated in US Dollars and Vietnamese dong:

Payment Currency of this Contract shall be denominated in US Dollars (USD) and Vietnamese Dong (VND).

Payment Currency of this Contract shall be denominated in United States Dollars for the Foreign Payable amount and in Vietnam Dong for Local Payable amount.

5.2.2. Terms of Payment: Terms of Payment specified in Article 14.2 of SCC in this contract.

6. Forms of contract: Lump-sum

7. Total Implementation Time: Three hundred sixty-five (365) days from the contract effective date to the date of FAC (*The contract implementation period meet with regulations specified in Section 1 of Chapter I - Instructions Contractor, part II Technical Requirements, the chapter V and VII General and specification contract conditions and the Proposal and results of negotiation and finalization of the contract between the two parties*), of which:

- The time for installation, setup, configuration, system integration, technical acceptance testing (ATP), and issuance of the Provisional Acceptance Certificate (PAC) is 280 days from the Contract Effective Date (266 days for technical acceptance + 14 days for completing documentation and issuing the PAC).

- The Network stabilization shall commence on the Provisional Acceptance Date and shall be considered to be complete within 60 days from the PAC and the Certificate of Network stabilization completion shall be signed by the Contractor, the Buyer and End-User.

- Final Acceptance Certificate (FAC) shall be issued upon the Contractor' presentation of PAC and Certificate of Network stabilization completion. Final Acceptance Certificate (FAC) shall be signed by the Contractor, the Buyer and End-User within 25 days.

8. Limitation of Liability

8.1. Notwithstanding any other provision in this Contract, and irrespective of any fault, negligence or gross negligence of any kind, in no event shall either party or any of its directors, officers, employees or agents be liable to the other party for any consequential, incidental, indirect, reliance or special (including punitive) damages, including, but not limited to, loss of profit or revenues, loss of goodwill or reputation, loss of data or information, loss of interest, downtime loss, cost of interrupted operation of the Network.

8.2. Notwithstanding any other provision in this Contract, the total liability of the Contractor on any claim, whether in contract, tort (including negligence), infringement of intellectual property rights, or otherwise, arising out of, connected with, or resulting from the manufacture, sale, license, delivery, repair, replacement or use of any supplies shall not exceed one hundred percent (100%) of the Total Contract Price Net.

8.3. Foreign Contractor, Local Contractor shall be liable for their own portion of the project.

9. Effectiveness of the Contract:

9.1. Contract shall only come into force on the date when all the following conditions have been fulfilled:

- a. Contract signed by all parties;
- b. Receipt by the Buyer of Performance Security;

9.2 The contract expires after the two parties sign the liquidation of contract in according with the law.

This Contract is made in eight (08) originals to be signed by below representatives. Each party shall be furnished with two (02) originals.

IN WITNESS WHEREOF, this Contract has been duly signed by the Parties hereto, on the day written above

Contractor consist of:

BUYER:

Authorized signatory:

Authorized signatory:

Name:

Name:

Title:

Title:

PERFORMANCE SECURITY ⁽¹⁾

[Location]_____, [Date]_____

To: _____ *[insert the Beneficiary's name]*
(hereinafter referred to as the Beneficiary)

At the request of the Supplier *[insert name of Supplier]* (hereinafter referred to as Supplier), who has been the successful Bidder of the procurement _____ *[the procurement's name]* and commits to enter into contract of good supply for the aforesaid procurement (hereinafter referred to as Contract)⁽²⁾;

Pursuant to the Bidding documents (or contract), the Supplier must give a Performance Guarantee issued by a bank with a given amount to ensure their duties and obligations in the performance of the contract;

We, _____ *[insert name of the bank]*, located in _____ *[insert name of country or territory]* with registered headquarters at _____ *[the bank's address⁽³⁾]* (hereinafter referred to as "Bank"), hereby undertake to guarantee the performance of the contract by the Supplier with an amount of _____ *[insert equivalent value in figures and words and currency as specified in SCC Article 5.1 of the Bidding documents]*. We undertake to pay you unconditionally and irrevocably any sum(s) not exceeding _____ *[insert amount(s) in figures and words]* upon receipt by us of your first demand in writing declaring the Supplier has breached the Contract within the effective period of the performance security.

This guarantee comes into effect from the issue date until _____ [date].

Legal representative of the Bank

[Full name, position, signature and stamp]

Notes:

(1) Applicable only when the form of performance security is a bank guarantee

(2) If the bank requires that the contract is signed before the performance guarantee is issued, the Procuring Entity shall report to the Beneficiary for consideration and determination. In such a case, this paragraph can be rewritten as follows:

“At the request of _____ *[insert name of Supplier]* (hereinafter referred to as Supplier), who is the successful bidder for _____ *[insert name of procurement package]* and has signed Contract No. _____ *[insert Contract No.]* dated *[insert date-month-year]* (hereinafter referred to as Contract)”

(2) Clearly state the bank's address, phone number, fax and email for contact

Specify a time limit in line with SCC 5.1

BANK GUARANTEE FOR DOWN PAYMENT ⁽¹⁾

[Location]_____,[Date]_____

To: _____[insert the Beneficiary's name]
(hereinafter referred to as the Beneficiary)

[The name and number of the Contract Agreement]

According to conditions of SCC in the Contract, _____*[insert name and address of the Supplier]* (hereinafter referred to as the Supplier) is required a Bank Guarantee for down payment to ensure the proper use of an advance of _____ *[insert amount(s) in figures and numbers and currency]* for the performance of contract by the Supplier;

We, _____*[insert name of the bank]*, located in _____*[insert name of country or territory]* with registered headquarters at _____*[the bank's address⁽²⁾]* (hereinafter referred to as "Bank"), at the request of the Beneficiary, hereby agree to pay you unconditionally and irrevocably any sum or sums not exceeding in total an amount of _____*[insert amount(s) in figures and words as specified in SCC Article 13.1 of the Bidding documents]*.

In addition, we hereby agree that any change, supplement or modification to the conditions of the Contract or any relevant document entered into between the Supplier and the Beneficiary shall not change any our duty or obligation under this guarantee.

The value of this guarantee shall gradually decrease in proportion to the advance that the Beneficiary recovers through payment periods prescribed in Article 5 of the Contract together with the certification of advance recovery issued by the Beneficiary.

This Guarantee shall remain effective and in full effect from the date of the advance payment received by the Supplier under the Contract until _____⁽³⁾*[insert date]* or upon the full recovery of the advance, whichever is sooner.

Legal representative of the Bank

[Full name, position, signature and stamp]

Notes:

(1)Set requirements based on specific conditions of the procurement package, in line with SCC 13.1

(2) Bank address: clearly state address, phone number, fax and email for contact.

Delivery date specified in the Contract. If delivery by instalment is allowed, it may be stipulated that the guarantee will expire when the value of delivered and accepted goods is larger or equal to the amount of advance. Where it is necessary to extend the time for contract execution, the bank may be required to extend the effective period of the guarantee for advance.

WARRANTY SECURITY ⁽¹⁾

_____, day ____ month ____ Year ____
To: ____ [*insert name of Beneficiary*]
(Hereinafter called the Beneficiary)
[*Insert name and number of the contract*]

Guarantor:

We are informed that you have entered into a contract No.....
(Hereinafter referred to as the "Contract") with the Joint Venture includes
..... having its registered address at (Hereinafter
referred to as "Foreign contractor") and having its
representative address at (Hereinafter referred to as the "Local
contractor") for Project: "....." and under the contract, the
Foreign contractor has to provide you with the warranty Bond.

At the request of the Foreign contractor, We, ..., having registered address
at issue this warranty for USD (In word:
.....), in your favor to guarantee the Foreign contractor's warranty
obligations under the contract as agreed.

We hereby unconditionally and irrevocably undertake to pay you any sum(s) in the
aggregate not exceeding USD (In word:
.....) upon our receipt of the Beneficiary's original written
demand stating that the Foreign contractor has failed to fulfill this warranty obligations
under the contract as agreed, the guarantee REF. number and the amount the
Beneficiary request the bank to pay, accompanied by the original bond and its related
amendment(s) (if any).

The beneficiary of Performance Security: VNPT Net Corporation

Name of the Bank:

Account number:

Any demand under this bond shall be made by letter, duly signed and sealed by
authorized representative of the Beneficiary.

This security is effective since the date of issue and shall expire at the earliest of the
following (hereinafter called the "Expiry"):

- (i) The end of or,
- (ii) When the bank has completed payment obligations under this bond.

Demand documents under this bond must be sent to and received by us in our working hours and before the expiry ----- Viet Nam.

After the expiry, this bond shall automatically become null and void whether or not the original bond and its related amendments (if any) are returned to us for cancelation.

This security is issued in one (01) sole original and it not transferable or assignable.

This Security is governed by and construed in accordance with the Vietnamese Laws.

The legal representative of the bank
[name and title, sign and stamp]