Request For Proposal

for the

B5G Software-Defined Radio Communications Payload

(REF No. : TASA-P-1130160)

TAIWAN SPACE AGENCY

Taiwan, R.O.C.

August 09, 2024

(1st amendment on September 18, 2024)

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PART I

Executive Summary and Bidder Instructions

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Part I: Executive Summary and Bidder Instructions

1. Section 1 Executive Summary

1.1. Introduction

This Request For Proposal (RFP) prepared by Taiwan Space Agency (TASA) provides the information needed to submit proposals for the B5G Software-Defined Radio Communications Payload of the TASA's Beyond 5G Experimental Satellites (B5G-EP) program.

1.2. Content of the Request for Proposal

1.2.1. Applicable Documents

The RFP is organized as follows:

Part I Executive Summary and Bidder Instructions
- Section 1: Executive Summary
- Section 2: Bidder Instructions
- Section 3: Evaluation Criteria and Procedures

Part II Model Contract (Terms and Conditions)
- Appendix I Contract Price Breakdown
- Appendix II Statement of Work
- Appendix III Data Deliverables
- Appendix IV Acceptance Criteria and Procedures
- Appendix V Milestone Payment Schedule

Part I, Executive Summary and Bidder Instructions, provides general information on the B5G-EP mission, Taiwan Space Agency (TASA) acquisition approach, proposal preparation instructions, and bid award process. Part II, Model Contract, plus Appendixes, provides the model contract for the B5G Software-Defined Radio Communications Payload, including the Statement of Work, Data Deliverables, and payment schedule, etc.

1.2.2. Reference Documents

N/A

1.3. B5G-EP Mission Description

1.3.1. Mission Overview

B5G communication satellites will be launched starting in 2027. The mission life is designed to support mission execution and operations at least 3 years.

B5G LEO communication satellites should be able to provide network access for disaster prevention, environmental monitoring, backup data communications and maritime Internet of Things. And provide the optical inter-satellite link in one of the first two experimental satellite

for high-reliability communication links to covering Taiwan's main island and outlying islands

1.3.2. Operational Concept

The B5G-EP satellite operations are conducted from the TASA Ground System. The Ground System is composed of the Satellite Operation and Control Centre (SOCC), the Telemetry, Tracking, and Command (TT&C) stations, and a Satellite Network Operation System (SNOS) .

The SOCC personnel will monitor and command the Satellite by using real-time health and status data. Command uplink files will be generated and forwarded to the TT&C station and transmitted on an uplink data stream. The SNOS personnel will monitor and manage satellite network operations in real time to achieve 24-hour network connectivity.

1.4. Overview of the Scope of Work

TASA will enter into a Firm-Fixed-Price Contract for the B5G Software-Defined Radio Communications Payload.

For Beyond 5 Generation (B5G) mission, TASA develops Ka-band high-data throughput communication payload system for the development and functional verification of low-orbit communication satellite mission.

The primary responsibility of the Contractor during the course of the program is to ensure the completion of B5G Software-Defined Radio Communications Payload for the B5G-EP satellite. The Contractor shall design, development, fabrication, assembly, integration, and test of the Ka-band high-data throughput communications payload system as described in the Model Contract.

2. Section 2 Bidder Instruction

2.1. General Instructions

Taiwan Space Agency (TASA), as the Purchaser, applies Open-Bid tendering procedures to the procurement of the B5G Software-Defined Radio Communications Payload contract awarded to the winner selected publicly and objectively and successfully completed the price negotiation with Purchaser. Purchaser is pleased to solicit Bidders who fulfil the qualification requirements specified in Section 2.2 to submit proposals in accordance with the procedures set forth in this section.

The titles and paragraph heading of the RFP are inserted for convenience only and shall not affect the interpretation of any provision.

With regard to the matters not provided for in the RFP, the TASA Procurement Regulation shall govern. If there are un-stipulated matters or the applicable provisions are vague or contradictory, such matters or provisions shall be subjected to TASA's interpretation and TASA will interpret such matters or provisions to best meet the purpose of this Bid and to fairly treat all bidders.

2.2. Qualification Requirements

2.2.1. Qualification Criteria

The Bidders shall meet and comply with the following requirements and provide the verification specified in Section 2.2.2:

1. The Bidder shall be a company or an organization legally established and existing in the country where it is registered.
2. The Bidder shall successfully complete the actions of designing, manufacturing, and testing Communications Payload at least once in orbit Satellites or Space stations by the Bid Due Date in Article 2.8.3.
3. The Bidder shall employ substantial manpower.
4. Bidder's paid-in capital is not less than NTD 88,000,000 or equivalent, or its financial statement for the latest year is in conformity with following criteria: (Bidder's paid-in capital will be converted into New Taiwan Dollars at the spot closing selling rate of the foreign exchange transaction at the Bank of Taiwan on the business day before the date of bid opening.)
   (1). The net asset value is not less than NTD 73,333,333 or equivalent. (Bidder's net asset value will be converted into New Taiwan Dollars at the spot closing selling rate of the foreign exchange transaction at the Bank of Taiwan on the business day before the date of bid opening.)
   (2). The current assets are not less than the current liabilities.
   (3). The total liabilities do not exceed 4 times of the total net asset value.

2.2.2. Qualification Evidence

The Bidders shall submit the following documents for evidencing the above qualification criteria; if the proof document is not made in English, an English translation should be provided:

1. Non-original copies of registration documents.
2. Copies of the proof (contract).
3. Copies of the proof of having the professional and general human resources necessary for the subject of this procurement at present.
4. Copies of the proof of its paid-in capital, or the financial statement audited by an accountant or an auditing entity for the year 2022 or year 2023.

2.3. Instructions for Bid

2.3.1. Budget

The budget for this procurement is **NTD 880,000,000**.

2.3.2. Point of Contact

Bidders shall designate a person as the point of contact and advise TASA of the name, title, telephone and fax number, and e-mail address in the bid.

TASA's point of contact is as follows:

Attention:

Ms. Hsueh-Lun Tung

Contracts Manager
Taiwan Space Agency
8F, 9 Prosperity 1st Road, Hsinchu Science Park, HsinChu 30078, Taiwan
Telephone: 886-3-5784208 ext.7241
Email: hltung@tasa.org.tw

2.3.3. RFP Addendum

As soon as changes or modifications are found to be necessary for any part of the RFP, an addendum to the RFP will be issued to all potential Bidders or published on www.tasa.org.tw (website) no later than seven (7) days before the Bid due date. Beyond that date, no changes or modifications will be made and the as-stated content in the RFP will be considered effective.

2.3.4. Proposal Organization

The proposal shall consist of three volumes: (1) Executive Summary (Volume I) (2) Technical and Program Proposal (Volume II), and (3) Price Proposal (Volume III).

The Bidder shall organize and submit proposal materials in the manner specified as follows:

Table 2-1 Proposal Volumes and Quantities

Volume I (Executive Summary): 1 Signed Original + Electronic Files *		
Volume	Title	Page Limits
I	Executive Summary	Section A: 30 pages Section B: No Limit

Volume II (Program Proposal): 1 Signed Original + Electronic Files *		
Volume	Title	Page Limits
II	Program Proposal	100 Pages

Volume III (Price Proposal): 1 Signed Original + Electronic Files *		
Volume	Title	Page Limits
III	Price Proposal	No Limit

Notes: The pages in excess of the Page Limits may not be read and may not be taken into account in the evaluation. The Bidder is encouraged to submit only essential information to each of the above chapters. The page count will not be a factor for scoring. However, all the pages in the submitted proposal are deemed integral parts of the Contract.

* The electronic files shall be in the Microsoft Office and/or pdf format.

2.4. Content of the Proposals

The information in the proposal volumes should correlate directly and sequentially with the instructions presented below. Cross references may be used to prevent excessive duplication. Each section of the proposal should provide an obvious correlation to the specific questions and requirements within each instruction. Volume I and II shall not contain any Bid Price information. The Price information shall be described only in Volume III. Purchaser has the right to ask bidders to clarify items in their proposals and to supply additional data.

All the information provided in the Proposals should be presented in English. For government documents made in language other than English, an English translation should be attached to the original document.

Proposals shall be prepared according to the following breakdown:

Volume I Executive Summary including the letter of authorization for delegation as Annex 1
Volume II Program Proposal
Volume III Price Proposal including the specimen of letter of compliance as Annex 2.

2.5. Volume I: Executive Summary

Charts/Tables shall be provided to show a top-level development schedule, organization, and implementation of overview of scope of work.

Section A: Proposal Summary
The Proposal summary shall contain a brief overview of the Proposal. It shall include the top level schedule, organization/management structure, design/analysis/manufacture/test approach, etc.

Section B: Required Document for Qualification to Bid
In order to establish that the Bidder has adequate resources to complete the work of B5G Software-Defined Radio Communications Payload, the Bidder shall provide the necessary information to verify that it meets or exceeds the qualifications stated in this RFP. paragraph 2.2 above.

Failure to meet the qualifications will result in disqualification from further consideration of the Bidder’s proposal. TASA reserves the right to request the Bidder to clarify the qualification of proof documents submitted.

2.6. Volume II: Program Proposal

The bidder shall provide a detail description of the proposed Communications Payload System development as listed in the following sections.

Section A: Space Flight Heritage of Communications Payload System
This section shall provide a description of the Space flight heritage in Communications Payload System development. As a minimum, the following information shall be provided: an overall introduction about the flight heritage of the payload development.

Section B: Proposed Development
The bidder shall provide a detail description of the proposed Payload System development, including:
1.the proposed design an existing design, modified from previous design, or new design,
2.the approach for manufacturing, assembly, verification, and test,
3.the approach for key designs, including electrical function, mechanism, thermal, communication network operation.
4.The proposed software should have a complete architecture, data interface, function and operation description.
5. The proposed training content should include the description of the design, the operating procedures of the equipment, the planning content of the actual operation drill, the teaching material package and the number of hours of training provided.

Section C: Program Management

A description of the Bidder's organization shall be provided. Key individuals who will perform the work under the contract shall be identified, including the designated Program/Mission Manager, and qualifications shall be included. Progress reporting and tracking, including production status monitoring, production problem reporting, test failure reporting, qualification and development program reporting, and anomaly investigation reporting, shall be described. Major subcontractors shall be listed, and the approach to subcontract management shall be described.

The master program schedule shall be elucidated, including major milestones, interface activities, and other critical program activities.

Section D: Product Assurance

The Proposal shall include a qualification status summary, with any current or planned development programs required for the proposed development.

The Bidder's product assurance program shall be described, including parts program requirements, materials and process requirements, quality assurance, and system safety. The Bidder shall describe its Product Assurance Program.

Section E: Risk Assessment and Mitigation
The Bidder shall include in his Proposal a recommended approach to overall risk assessment and mitigation of the program.

The Bidder shall include in his proposal any information which would assist TASA in evaluating this aspect of the risks of contract execution, export license approval, program schedule, potential technical risks, and others as proposed may cause potential difficulties on contract execution, and can be minimized and mitigated.

2.6.1. Compliance Summary

The bidder shall provide the declaration of compliance with the key requirements compliance check list according to the following table. Non-compliance to the key requirements compliance check list will be considered as an ineligible bid from further evaluation.

Table 2-2 Key Requirements Compliance Check List

Key Requirements			Compliance (Yes/No)	Proposal Section No.
Bidder Instructions		Space flight heritage of Communications Payload System		
Appendix II SOW	Sec. 2.1.1	Transmitter		
		-Operation Frequency		
		-Beams		
		-Dwell time for beam-hopping		
		-Aggregate EIRP		
		-Beamwidth		
		-Sidelobe		
		-Polarization		
		-Cross polarization		
		-Scan Range		
		-Grating lobes		
		Required Rejection		
		Modulation		
		-Waveform		
		-Modulation / Coding		
		-Throughput Data Rate		
		-Multiple Access		
	Sec. 2.1.2	Receiver		
		-Operation Frequency		
		-Beams		
		-Dwell time for beam-hopping		
		-Beamwidth		
		-Sidelobe		
		-Polarization		
		-Cross polarization		
		-G/T		
		-Scan Range		
		-Grating lobes		
		Modulation		
		-Waveform		
		-Modulation / Coding		
		-Throughput Data Rate		
		-Multiple Access		
	Sec. 2.1.3	On-Board Processor Requirements		
	Sec. 2.2	Power Requirements		
	Sec. 2.3	Electrical Interfaces Requirements		

	Sec. 2.4	Interface Requirements between communication Payload system and User / Feeder Terminal		
	Sec. 2.5	Interface to Optical Communications Terminal		
	Sec. 2.6	Physical Properties		
	Sec. 2.6.1	Connectors		
	Sec. 2.6.2	Mass		
	Sec 2.6.3	Power consumption		
	Sec. 2.7	Thermal Design Requirements		
	Sec. 2.8	Environmental Requirement		
	Sec 2.8.1	Dynamic Environments		
	Sec 2.8.2	Random Vibration		
	Sec 2.8.3	Sine Vibration		
	Sec 2.8.4	Shock		
	Sec 2.8.5	Component Mounting		
	Sec. 2.9	Thermal Environments		
	Sec. 2.9.1	Temperature Range		
	Sec. 2.9.2	Temperature Extremes		
	Sec. 2.9.3	Thermal Cycling / Thermal Vacuum Tests		
	Sec. 2.10	Electromagnetic Compatibility (EMC)		
	Sec. 2.10.1	Conducted EMC (CE & CS)		
	Sec. 2.10.2	Radiated EMC (RE & RS)		
	Sec. 2.10.3	EMC Test		
	Sec. 2.11	Bonding, Grounding, and Isolation		
	Sec. 2.11.1	Bonding		
	Sec. 2.11.2	Grounding		
	Sec. 2.11.3	Isolation		
	Sec 2.12	Inrush Current		
	Sec 2.13	Radiation Environment		
	Sec 2.13.1	Total Dose and Non-Ionizing Energy Loss		
	Sec 2.13.2	Single Event Effects (SEE)		
	Sec 2.14	Transportation, Handling and Storage		
	Sec. 3	Product Assurance Requirements		

2.7. Volume III: Price Proposal

The Bidder shall provide the prices corresponding to the items listed in Appendix I Contract Price Breakdown of the Model Contract. For the needs of clarity, the Bidder may add additional items with explanation other than those listed in Appendix I Contract Price Breakdown of Model Contract.

The price breakdown provided by the Bidder is for the purpose of evaluation only detailed in 3.4. Evaluation Criteria for the Price Proposal. The payments of this contract will be made as scheduled in the Appendix V Payment Schedule of Model Contract.

The Bid Price shall be based on the full requirements in the RFP.

2.7.1. Price Summary

The Bidders should provide the proposed Prices in their price proposal as the Price Breakdown tables, Table 2-3 and Table 2-4, as below. The Bidders should be aware that, for the purpose of having a consistent basis of reference, when evaluating the Price Proposal, the proposed Prices, which are not in New Taiwan Dollar, will be converted into New Taiwan Dollars at the spot closing selling rate of the foreign exchange transaction at the Bank of Taiwan on the business day before the date of bid opening.

Table 2-3 Price Breakdown of CLINs

Item	CLIN	Description	Price	Remarks
101	CLIN 1	One Set of Payload Engineering Design Unit (EDU)		
102	CLIN 2	Ground Test Equipment		Sum of Item 102-a, 102-b, and 102-c
102-a	CLIN 2-1	Two set of Ground Test Equipment 1		
102-b	CLIN 2-2	One Set of Ground Test Equipment 2		
102-c	CLIN 2-3	One Set of Ground Test Equipment 3		
103	CLIN 3	Payload System Flight Model (FM)		Sum of Item 103-a, 103-b and 103-c
103-a	CLIN 3-1	One Set of Payload System Flight Model		
103-b	CLIN 3-2	Twenty Sets of User Terminals		
103-c	CLIN 3-3	One Set of Feeder Terminal		
104	CLIN 4	Software & Documentation (on Application Programming Interfaces (APIs) and relevant documentation to enable operation and connectivity to the payload)		Sum of Item 104_a and 104_b
104-a	CLIN 4-1	Software & Documentation for EDU		
104-b	CLIN 4-2	Software & Documentation for FM		
105	CLIN 5	Training		1.Sum of Item 105_a and Item 105_b 2.Taiwan Income Tax (3%) included
105-a	CLIN 5-1	Training for EDU		Taiwan Income Tax (3%) included
105-b	CLIN 5-2	Training for FM		Taiwan Income Tax (3%) included
106	CLIN 6	Support Services		1.Sum of Item 106_a, Item 106_b, and Item 106_c 2.Taiwan Income Tax

Item	CLIN	Description	Price	Remarks
				(3%) included
106-a	CLIN 6-1	Payload Integration Test Support Service		Taiwan Income Tax (3%) included
106-b	CLIN 6-2	Payload End-to-End Test Support Service		Taiwan Income Tax (3%) included
106-c	CLIN 6-3	Payload Support Service for the Satellite Mission Operation		Taiwan Income Tax (3%) included
110	Total	Total Contract Price		Sum of Item 101 ,Item 102, Item 103, Item 104, Item 105, and Item 106

* For local contractor, the total Contract Price shall include Taiwan 5% business tax but exclude Taiwan 3% Income Tax.

Table 2-4 Tax calculation of CLIN 5 and CLIN 6

Item	Description	Net Price (Contract Applicable Price minus Taiwan Taxes) 97%	Taiwan Income Tax (3%)	Contract Applicable price
105	CLIN 5 Training			Sum of Item 105_a and Item 105_b
105_a	CLIN 5-1 Training for EDU			
105_b	CLIN 5-2 Training for FM			
106	CLIN 6: Support Services			Sum of Item 106_a, Item 106_b and 106_c
106-a	CLIN 6-1: Payload Integration Test Support Service			
106-b	CLIN 6-2: Payload End-to-End Test Support Service			
106-c	CLIN 6-3: Payload Support Service for the Satellite Mission Operation			

Note:

The tax calculation formula is:
Net Price= Contract Applicable Price X 0.97
Taiwan Income Tax = Contract Applicable Price X 0.03
Contract Applicable price = Net Price+ Taiwan Income Tax

2.8. Guideline for Bid Submission

Bidders shall comply with the instructions in all sub-sections of this Section. Bids submitted which do not comply with these requirements will be returned to Bidders.

2.8.1. Packing Instructions to Prevent Unauthorized Disclosure

Proposals must be sealed with proper identification and sealed in bidding boxes. The boxes shall be marked on the outside with TASA's RFP number, the full name and address of the Bidder, the name and e-mail address of the contact person, the volume number, and the marking "Contract Proposal Materials of B5G Software-Defined Radio Communications Payload ".

2.8.2. Bid Submission

A Bid shall consist of Executive Summary (Volume I), Launch Service and Program Proposal (Volume II) and Price Proposal (Volume III). Sealed Bid shall be received by TASA through certified airmail, express courier service, or hand carry, by the bid due time at the following address:

Attention:

Ms. Hsueh-Lun Tung

Contracts Manager
Taiwan Space Agency
8F, 9 Prosperity 1st Road, Hsinchu Science Park, HsinChu 30078, Taiwan
Telephone: 886-3-5784208 ext.7241

2.8.3. Bid Due Date

Bids must be received by the Purchaser on or before **12:00 pm, October 7, 2024** Taiwan time**.** Bids received after this date and time will be returned unopened.

2.8.4. Validity Date of Bid

The Bidder's proposal and the price quote shall remain valid for 180 days from the date of the opening of the Proposal.

2.8.5. Non-Withdraw of Bid

Except under the circumstances that Bidder's proposal is rejected or disqualified by the Purchaser, the Bidder shall not withdraw the Bid after the submission.

2.8.6. Price Basis

The price quoted in Volume III, Price Proposal, shall be firmly fixed and not subject to adjustment, change, or escalation before conducting the price negotiation process as set forth in Section 2.11.4. The Contract Price shall include all costs, expenses and profit of Bidder to perform the Work to fulfil all its obligations specified in the Contract, including but not limited to, the costs of establishing the PB and taxes pursuant to the Contract.

2.8.7. Non-Commitment of the Purchaser

The preparation and submission of proposal by the Bidder shall be without commitment and free of charge to the Purchaser. The Bidder is not entitled to claim any sort of compensation.

2.8.8. Circumstances of Prohibition from Participating in Bidding

A supplier which has any of the following circumstances is prohibited from participating in biding, being awarded or sub-contracting, or assisting bidders in case that any of the following circumstances occurs to the supplier:

1. where the supplier has provided planning or design services to the Purchaser, and the procurement is resulted from such planning or design;
2. where the bid documentation has been prepared by the supplier for the Purchaser;
3. where the supplier provides bid evaluation service to the Purchaser for the procurement;
4. where the supplier knows, by fulfilling a contract with the Purchaser, a certain information which is unknown to other suppliers or should be kept secret, and the supplier can be benefited in from winning the award by taking advantage of the information;
5. where the supplier is a project management service provider entrusted by the Purchaser and the procurement is related thereto.

Where there is no conflict of interest or concern of unfair competition, circumstances of referred to in the preceding sub-paragraphs 1 and 2 of the preceding paragraph may not be applicable to the subsequent procurements after approval of the Purchaser.

2.8.9. Waiver of Commission

The Bidder warrants that no third party has been employed or retained to solicit or secure toward obtaining the Award of Contract, based upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee. It is, however, permissible that Bidder, by virtue of bona fide commercial arrangements, retains professional or other services and pays remuneration based on the services rendered. Any breach or violation of this warranty may cause disqualification of the Bidder.

2.8.10.Proposal Language

English shall be the language used in the proposals and shall be used in all correspondences between the Bidder and the Purchaser.

2.8.11.Proposal Certification

The original of each volume must be signed by an officer of the company who is authorized to act therein. In the case of discrepancies between the Electronic Files and any copy of the Bidder's proposal or the signed original, the signed original shall take precedence.

2.8.12.Price Information Limited to Price Proposal

The Price Proposal (Volume III) shall be the volume where any and all price information may appear.

2.8.13.Clarification of RFP Documents

Bidders shall carefully examine the RFP. Documents and fully inform themselves as to all the conditions and requirements which can in any way affect the works or the cost thereof. Should a Bidder find discrepancies in or omissions from the specifications or instructions, or should the Bidder be in doubt as to their meaning, the Bidder shall raise questions fifteen (15) days before the date of Bid Opening by email/letter/fax to the Purchaser. Oral explanations or instructions will not be binding.

The responses to the Bidder’s questions will be made by TASA 5 days before the Bid Due Date.

2.8.14.Rights of TASA

If the Bid contains omissions, alterations, additions, or items not called for in the RFP, TASA reserves the right to reject the Bid or request the Bidder to clarify the above deviation.

2.9. Bid Opening

Proposals will be opened on **at 15:00 on October 7, 2024** Taiwan Time at TASA meeting room.

2.9.1. Condition of Bid Opening

TASA will open the Bids where there are one or more Bids. The term ”one or more Bids” referred means there are one or more Bidders submitting their Bids, which meets and the following requirement:

- The Bid, in writing and sealed, has been submitted by mail or in person at TASA designated place before the deadline for bidding, according to Section 2.8.1, 2.8.2, and 2.8.3.

2.9.2. Ceasing of Bid Opening

TASA will open the bid(s) where there is one or more Bids submitted. Where there are any of the following circumstances under which Bids may not be opened or awarded.

1. Where the content of RFP is amended or supplemented;
2. Where illegal or improper activities that may impair the fairness of the procurement are found;

3. Where there is an emergency;
4. Where the plan for procurement is changed or cancelled; or
5. For any other special circumstances as determined by TASA.

2.9.3. Prohibitory Notes for Bidders

In case that any of the following circumstances occurs on the part of a Bidder, TASA will not open the Bid of such Bidder when such circumstance is found before Bid opening, or award the contract to such Bidder when such circumstance is found after Bid opening:

1. The content of the Bid is inconsistent with requirements of the RFP;
2. The Bidder borrows or assumes any other's name or certificate to bid, or bids with forged documents or documents with unauthorized alteration;
3. The Bidder forges documents or alters documents without authorization in bidding;
4. The Bidder has any activities in breach of laws or regulations, which impair the fairness of the procurement; or
5. The Bidder is listed in the Taiwan Space Agency website as being prohibited from participating in bidding or being awarded of any contract.
6. The Bidder is engaged in any other activities in breach of laws or regulations which impair the fairness of the procurement.

When any of the circumstances referred to in the preceding paragraph occurs to the winning Bidder before the award of contract but is found after award or signing of the contract, TASA shall revoke the award, terminate or rescind the contract, and may claim for damages against such tenderer except where the revocation of the award or the termination or rescission of the contract is against public interests, and is approved by the superior entity.

Where the situation of not opening or not awarding a contract as referred to in the Paragraph 1 of 2.9.2 causes the procurement procedures unable to continue, TASA may declare that the procurement is nullified.

2.9.4. Personnel to Attend

The Bidder may attend the meeting of bid opening upon its sole decision. The authorized person shall present a "LETTER OF AUTHORIZATION FOR DELEGATION" (Annex 1) when attending the meetings and signing relevant documents on behalf of the Bidder.

TASA may limit the number of the Bidder's personnel attending the meetings as necessary.

2.9.5. Disposal of Bid Documents

If there is no winning Bidder following the Bid evaluation process, TASA will return all Bid documents which are not opened to respective Bidders upon Bidders' requests and costs, but retain one copy of Bid documents which have been opened.

2.10. Bid Review and Evaluation

Only those Bidders who meet the following conditions will be qualified Bidders for the bid evaluation process:

(a) Have met with the qualification criteria specified in the Section 2.2.1.

(b) The Total Bid Price (as Item 120 in the Section 2.7.1) is not higher than the budgets specified in the Section 2.3.1.

(c) Have provided declaration of full compliance with the key requirements compliance check list according to the table 2-2 in Section 2.6.1;

(d) Have successfully completed the clarification request process, if any.

TASA shall review and evaluate the submitted Bids in accordance with the requirements set forth in the RFP. Section B of Volume I proposal will be reviewed by qualification review team to determine whether the Bidders meet all the qualification criteria as described in Section 2.2.1. Any Bidder who cannot provide compliance information consistent with the qualification criteria will be disqualified from further evaluation.

The Bidder shall not alter its Bid after the opening of Bids. However, in case any ambiguity, inconsistency or obvious typing or clerical error is founded to its content when reviewing or evaluating the Bid, TASA may notify the corresponding Bidder by email/letter/fax to clarify in order to confirm the exact content. Oral explanations or instruction will not be binding. **Bidder needs to provide the contact information for these clarifications in its proposal.** Where the error is an explicit typing or clerical one, the Bidder may be permitted to supplement or amend it. However, any typing or clerical errors related to the Bid Price shall not be amended.

Any confirmation offered by the Bidder in response to the request of TASA after openings of Bids, such as clarification, correction, compliance, deletion, etc. shall not change the Bid Price.

The Bid will not be accepted in case the subject items offered by the Bidder are not sufficient and complete in accordance with the requirement in the RFP.

The bid opening and review process is illustrated in the Figures 2-1.

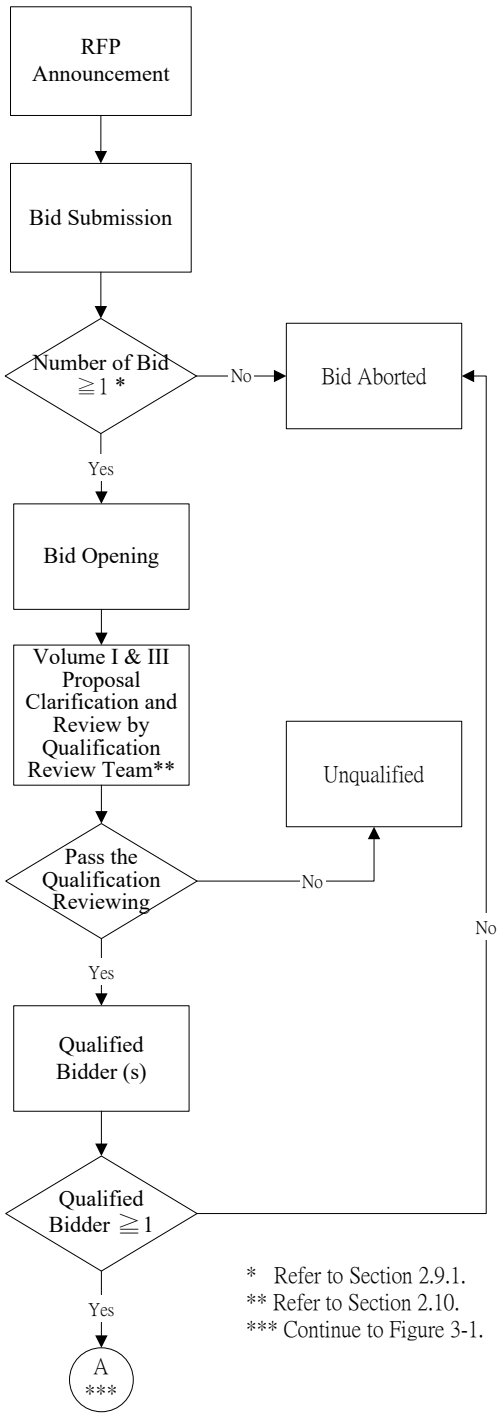

Figure 2-1 Bid Opening and Review Process

2.11. Award of Contract

2.11.1.The Winning Bid

The Contract will be awarded to the Winner as defined in Section 3, and its Bid Price shall be within the Purchaser predetermined ceiling price after price negotiation as stipulated in Section 2.11.4. TASA reserves a right not to award the contract and/or sign the contract if the plan for procurement is changed or cancelled.

2.11.2.Comprehensive Evaluation Process

Comprehensive evaluation will be conducted in accordance with the evaluation criteria set forth in Section 3 to determine the Winner(s), which could be one or more bids based on the decision of the evaluation committee. If less than one Winner is concurred by the majority of the evaluation committee and approved by the head of TASA, the bidding procedure shall be nullified.

2.11.3.Waiver of Bidders

Where TASA notifies a Bidder to explain or clarify, and the Bidder fails to respond within a time limit set forth in the notification, then such Bidder is deemed waiving its rights.

In case the waiving of explanation or clarification will not make influence on the Bidder to comply with the requirements set forth in the RFP, the said Bidder can still be awarded.

2.11.4.Price Negotiation

A price negotiation will be conducted with the Winner(s). In case the Winner(s) is more than one bid, a price negotiation will be conducted starting from the bid of the first place of the list of Winner(s). The Bidder(s) will be requested to reduce its bid price until the reduced price is within the ceiling price. The price negotiation may be held through a teleconference under bidder's prior request. The price negotiation process is illustrated in the Figures 2-2.

The first price negotiation meeting is planning to be held on October 23, 2024 Taiwan time. The meeting time will be scheduled at 9:00 am or at 16:00 pm.

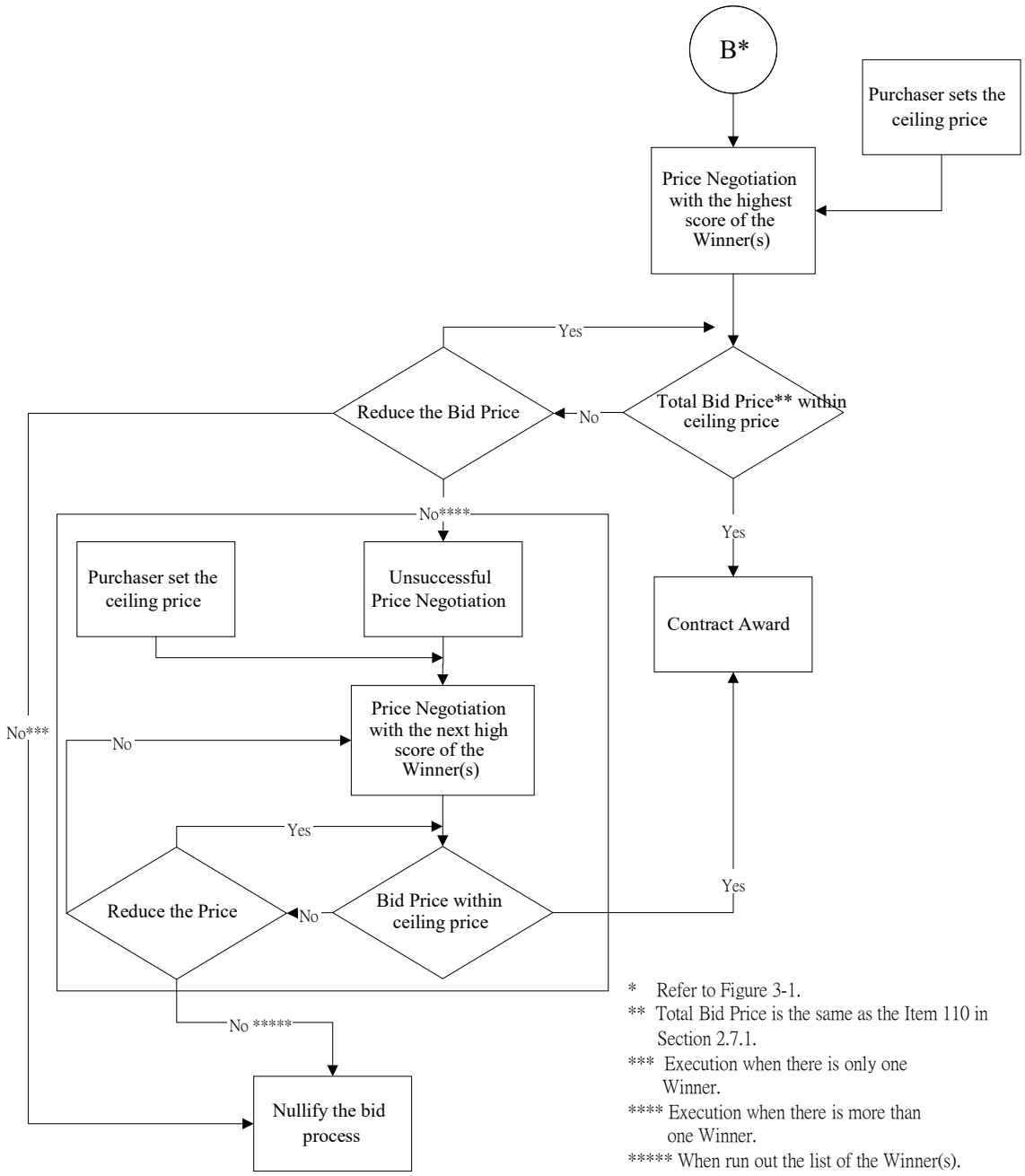

Figure 2-2 Price Negotiation Process

2.11.5. No Show-up Required

In awarding a Contract, when the Bidder in compliance with the principle of awarding, the procedures of comprehensive evaluation has been completed, TASA may not notify the Bidder to present. After award of the Contract, TASA will issue a Notice of Award and sign the Contract.

2.12. Outcome of Bid Opening

The outcome of the bid opening and evaluation will be published on the Procurement Bulletin on TASA website（www.tasa.org.tw）and be notified to all Bidders in writing. Where the opening of Bids is ceased due to no Bid, or where there is no qualified Bidder, the bid evaluation process shall be abolished. TASA has its sole discretion whether or not to arrange a second bid announcement.

2.13. Supplementary Instructions

2.13.1.Page Count

A page is defined as the face of a Letter size (8-1/2 x 11 inches) or A4 size (21 cm x 29.7 cm) sheet. Two pages can be printed on one sheet of paper. Text lines shall not exceed 45 lines per page. Two-column presentation per page is acceptable. The character size of the text shall be 12 points.

2.13.2.Illustrations and Tables

Folds of charts, tables, diagrams, or design drawings shall not exceed twice the size of an A4 size sheet with character size #12. Each printed side of folded pages shall count as two pages toward page limitations.

2.13.3.Page Count Exceptions

The page limitations shall apply as specified in Table 2-1, Section 2.3.4. Each page of the volume shall be counted, including attachments, appendices, and annexes, except for the following:

1. Tables of contents
2. Tables of illustrations
3. Title and Signature pages
4. Dividers
5. Blank pages
6. Resumes of key personnel (limited to one page per individual)
7. Certification Document of qualification
8. Work Breakdown Structure and supporting dictionary
9. Master project schedule

10. Specifications and standards provided
11. Acronym List
12. Cover Letter
13. Engineering Drawing in separate page（note in the drawing will not be evaluated）

2.13.4.Binding

The signed original of each volume shall be contained in a separate binder. Other copies are not restricted to be in permanent binders. All binders shall be capable of lying flat when opened. Each volume shall be numbered sequentially for the required number of copies. Each volume shall be bound front and back by thicker cover sheets. The outside front cover shall indicate the Bidder's name and address, the name of the solicitation and RFP number, the date of the submittal, the title of the volume, the copy number, an indication of any contents that are proprietary, and the total number of pages in the volume.

2.14. (Left Blank Intentionally)

2.15. Protest, Complaint and Anti-corruption

For any dispute between a Bidder and Purchaser arising out of the invitation to bid, the evaluation of the bid, the award of contract, the contract performance, or the inspection and acceptance, a protest or complaint may be filed in written to TASA (www.tasa.org.tw).

3. Section 3 Evaluation Criteria and Procedures

3.1. General Considerations

All proposals must provide sound technical approach and confidence to meet the objectives of the Contract. Proposals exceeding the requirements specified in this RFP will be favourably evaluated.

3.2. Guideline for Bid Evaluation

3.2.1. General

The evaluation process is illustrated in the Figures 3-1. All proposals of qualified bid submitted in compliance with Section 2.6.1, 2.8 and 2.10 will be scored by the designated evaluation committee during the evaluation process. The Executive Summary will be used for briefings to senior management of TASA and reviewed for qualifications, and will not be scored. Information in the Executive Summary should appear in other Chapters, as appropriate, to be scored.

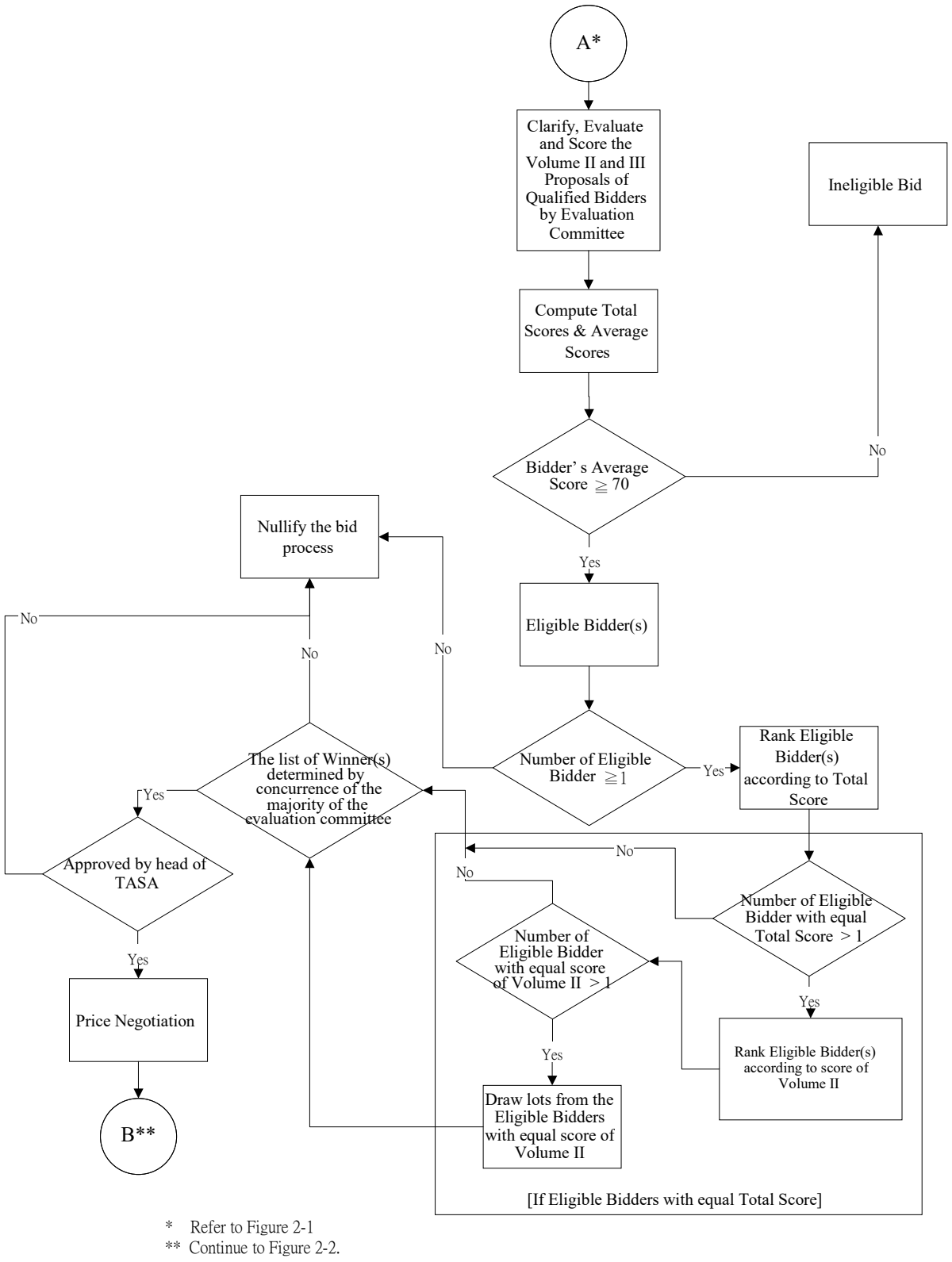

Figure 3-1 Bid Evaluation Process (Score of Volume II)

3.2.2. Clarification Request Process

TASA will issue clarification requests to one or all of the qualified Bidders, if deemed necessary by the evaluation committee. Clarification requests will allow the Bidders to clarify the proposals and to address areas that are unclear, or appear only to be marginally addressed. Bidder is required to provide responses within two (2) business days or mutually agreed time period after receiving clarification. Following completion of the clarification process, the proposals will be scored as written. Any new information received from the Bidders during the clarification process is intended to enhance the overall understanding, not the scores.

3.2.3. Proposal Scoring

Each evaluation committee member will score each qualified Bidder's proposals, including Launch Service and Program Proposal, and Price Proposal separately and independently. The score ranges are also shown in Table 3-1.

The maximum Subtotal Score for each Bidder, from any evaluation committee member, is 100 points. Then the Total Scores and Average Scores will be computed. The Total Score is defined as the sum of a Bidder's Subtotal Scores received from the scored evaluation committee members. The Average Score is defined as a Bidder's Total Score divided by the number of the scored evaluation committee members.

Table 3-1 Total scores for Proposal Evaluation Items

Chapter	Section		Score Range
Volume II: Program Proposal	A	Space flight heritage of Communications Payload System	20
	B	Proposed Development	30
	C	Program Management	10
	D	Product Assurance	10
	E	Risk Assessment and Mitigation	10
	Subtotal		80
Volume III: Price Proposal			20
Total Score (Maximum = 100)			100

3.2.4. Evaluation Process

A Bidder will be ineligible if its Average Score is less than 70 points. If there is no Bidder with the Average Score greater than or equal to 70 points, the bid shall be nullified. Bidder(s) with Average Score higher or equal to 70 becomes Eligible Bidder(s).

The Eligible Bidder(s) will be ranked according to their Total Score. If there are two or more Eligible Bidders with the same Total Score, then the Eligible Bidder will be ranked according

to the total score of Volume II (Program Proposal). If that score is still the same for two or more Eligible Bidders, drawing lots from the Eligible Bidders with the same score of Volume II will be conducted.

The Eligible Bidder(s) concurred by the majority of the evaluation committee and approved by the head of TASA will becomes the Winner(s). If there is no Winner, the bid shall be nullified. Price negotiation will be conducted according to the process in Section 2.11.4 with the Winner(s).

3.3. Evaluation Criteria for the Program Proposal

The proposal shall fully comply with the requirements specified in Table 2-2 Key Requirements Compliance Check List of Section 2.6.1.

3.3.1. Section A: Space flight heritage of Communications Payload System

To what extent the company's Space flight heritage in Communications Payload System including:

1. an overall program of designing, manufacturing, and testing in Communications Payload System.
2. the engineering tasks to be performed and demonstrates an in-depth knowledge to implement the tasks specified in the SOW.

3.3.2. Section B: Proposed Development

To what extent the performance of the proposed development can meet or be better than the requirements including:

1. is the proposed design an existing design, modified from previous design, or new design,
2. the approach for manufacturing, assembly, and test,
3. the approach for key designs, including hardware and software.
4. the approach for antenna and payload calibration and test technology.
5. the proposed software should have a complete architecture, data interface, function and operation description.
6. the proposed training content should include the description of the design, the operating procedures of the equipment, the planning content of the actual operation drill, the teaching material package and the number of hours of training provided.
7. A plan of how to lead at least two (2) Taiwan companies assigned or audited by TASA to develop Taiwan user terminals and verify with the communication Payload at TASA facility and in orbit.

3.3.3. Section C: Program Management

To what extent the Bidder organization and resources and assigned key personnel are experienced and adequate to complete the required tasks.

3.3.4. Section D: Product Assurance

To what extent the reliability prediction, product assurance program, and flight history provide high confidence of mission success.

3.3.5. Section E: Risk Assessment and Mitigation

To what extent the risks of contract execution, export license approval, program schedule, potential technical risks, and others as proposed may cause potential difficulties on contract execution, and can be minimized and mitigated.

3.4. Evaluation Criteria for the Price Proposal

Appropriateness, reasonableness, and completeness of the bid prices for each contract line items.

ANNEX 1
SPECIMEN OF LETTER OF AUTHORIZATION FOR DELEGATION

Date: _____

Taiwan Space Agency
8 F, 9 Prosperity 1st Road,
Hsinchu Science Park,
Hsinchu 30078.
Taiwan, R.O.C.

Subject: Letter of Authorization for TASA's RFP No. TASA-P-1130160

Dear Sirs:

We, _____, hereby authorize Mr./Ms. (Name and Title of the Person) of this Bidder to attend the meeting(s) on our behalf and whatever he/she promises or signs relevant to the captioned RFP will be bidding on us. We confirm that the specimen signature of the above-mentioned person that appears hereunder is true and correct:

Specimen Signature: _____

Thank you for your kind attention to the above.

Sincerely yours,

_____

Note:

1. The Bidder is requested to use the stationery of its own company in typing or writing a letter of authorization as suggested herein.
2. This letter is a must document and shall be included in the bid proposal.

ANNEX 2
SPECIMEN OF LETTER OF COMPLIANCE

Date: _____

Taiwan Space Agency
8 F, 9 Prosperity 1st Road,
Hsinchu Science Park,
Hsinchu 30078.
Taiwan, R.O.C.

Subject: Letter of Compliance for TASA's RFP No. TASA-P-1130160

Dear Sirs:

We, _____, hereby
(Name of the Bidder)

certify that we are fully comply with the Terms and Conditions and All Requirements of this RFP.

Sincerely yours,

_____

Note:

1. The bidder is requested to use the stationery of its own company in typing or writing a letter of compliance as suggested herein.
2. This letter is a must document and shall be included in the bid proposal.

Contract

Between

Taiwan Space Agency

And

[contractor]

For

B5G Software-Defined Radio Communications Payload

Contract No.: TASA-P-1130160

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Premises and Recitals

This Contract is made and entered into as of this [●] day of [●], 2024 by and between Taiwan Space Agency ("TASA"), an administrative corporation established and existing under the laws of Taiwan, with its principal office at 8F, NO. 9 Prosperity 1st Road, Science-based Industrial Park, Hsin-Chu City, Taiwan.

And

[●] (hereinafter referred to as "Contractor"), a corporation organized and existing under the laws of [●], with principal office at [●].

Whereas, TASA needs a contractor capable of providing the B5G Software-Defined Radio Communications Payload, as well as various deliverables as fully described in Appendix II, Statement of Work (hereinafter referred to as "SOW"), to support its Beyond 5 Generation (B5G) mission ("Project");

Whereas, Contractor has represented that it is a corporation duly organized and existing under the laws of the country where its principal office is located, as referenced above, and has taken all necessary corporate and other legal actions to authorize the execution, delivery and performance of the Contract;

Whereas, Contractor has full knowledge of TASA's requirements described in the Request for Proposal (RFP No. TASA-P-1130160) and has submitted proposals as requested in the RFP to TASA;

Whereas, Contractor has, before entering into the Contract, verified the correctness and sufficiency of the prices stated in the Contract, which shall, except as otherwise specified explicitly in the Contract, cover all its obligations provided in the Contract;

NOW, THEREFORE, in consideration of the covenants and premises herein contained, the parties hereto agree as follows:

Article 1
General

1.1 Definitions

In the Contract, unless the context otherwise requires:

1.1.1 Customer means TASA.

1.1.2 Contract means this Contract, together with the Exhibits and Appendixes listed in Article 1.2, as may be amended, supplemented and/or otherwise changed from time to time pursuant to Article 22.

1.1.3 Contract Effective Date ("CED") means the date on which all conditions precedent to the effectiveness of the Contract as specified in Article 21 have been completed.

1.1.4 Contract Line Items means the deliverable items to be provided by Contractor designated as Contract Line Item Nos. (CLIN) 1, 2, 3, 4, 5 and 6 as listed in Appendix I, Contract Line Items Price Breakdown, and described in Appendix II, SOW. Unless otherwise specified, where a Contract Line Item contains sub-items, the reference to the Contract Line Item or the Contract Line Item No. should denote each and all of the sub-items under the same CLIN.

1.1.5 Contract Price means the total consideration payable by Customer to Contractor pursuant to Article 5 of the Contract.

1.1.6 Contract Manager means the designated representative who shall act for Customer in all contracting actions.

1.1.7 DPU TASA Jobsite means "DPU named place of destination terms" as defined in the International Chamber of Commerce INCOTERMS 2020. Contractor shall be responsible for all risks and costs for the delivery of the deliverable Contract Line Items, including, but not limited to, international/inland freight, cargo insurance covering contracted price plus ten percent (10%), duties, taxes, charges and customs clearance expense, and unloading, etc., until the unloading of the deliverable Contract Line Items at TASA Jobsite. Taiwan duties and taxes associated with the import of the deliverable Contract Line Items shall be with TASA in accordance with Article 17.

1.1.8 TASA Jobsite means the satellite integration and test facility owned and operated by TASA, located near the office of TASA in Hsin-Chu Science Park, Taiwan, as specified in the SOW.

1.1.9 Project Manager means the project manager designated by Customer pursuant to Article 7.2 to act on behalf of Customer in the overall project management.

1.1.10 Performance Bond (PB) means the Performance Bond to be provided by Contractor pursuant to Article 5.4 for guaranty to the performance of the Contract.

1.1.11 Work means the whole scope of work to be performed by Contractor under the Contract as required by the SOW.

1.2 Contract Documents

The Exhibits and Appendixes attached to the Contract are integral parts of the Contract. In case of any conflict between the terms and conditions of the Contract and the exhibits and/or appendixes, the terms and conditions shall prevail over the exhibits and/or appendixes; in case of conflicts among the appendixes and/or among the exhibits, the parties shall discuss the resolution of such conflict based on common industry practice and the purpose of the Contract.

Exhibit A	Milestone Completion Certificate ("MCC")
Exhibit B	Certificate of Conformance ("COC")
Exhibit C	Service Completion Certificate ("SCC")
Exhibit D	All Work Completion Certificate ("AWCC")
Exhibit E	Contract Effective Date Certificate
Exhibit F	Power of Attorney
Exhibit G	Model of Performance Bond

Appendix I	Contract Line Items Price Breakdown
Appendix II	Statement of Work ("SOW")
Appendix III	Data Deliverables
Appendix IV	Acceptance Criteria and Procedures ("ACP")
Appendix V	Payment Schedule
Appendix VI	Contractor's Technical Proposal

Article 2
Scope of the Work

2.1 The procurement contemplated under the Contract covers a total requirement of the Contract Line Items listed below, as detailed in Appendix II SOW. The implementation of the Contract as a whole is essential.

CONTRACT LINE ITEMS

REQUIRED EQUIPMENT:

CLIN 1: Payload Engineering Design Unit (EDU)

CLIN 2: Ground Test Equipment

CLIN 2-1: Ground Test Equipment 1

CLIN 2-2: Ground Test Equipment 2

CLIN 2-3: Ground Test Equipment 3

CLIN 3: Payload System Flight Model (FM)

CLIN 3-1: Payload System Flight Model

CLIN 3-2: User Terminals

CLIN 3-3: Feeder Terminal

CLIN 4: Software & Documentation

CLIN 4-1: Software & Documentation for EDU

CLIN 4-2: Software & Documentation for FM

REQUIRED SERVICE:

CLIN 5: Training

CLIN 5-1: Training for EDU

CLIN 5-2: Training for FM

CLIN 6: Support Services

CLIN 6-1: Payload Integration Test Support Service

CLIN 6-2: Payload End-to-End Test Support Service

CLIN 6-3: Payload Support Service for the Satellite Mission Operation

2.2 The exact performance of the terms and provisions of this Contract is critical. Contractor undertakes to perform the Work in compliance with the requirements set forth in the Contract, including all Exhibits and Appendixes, professionally and in accordance with the industry standards and ethics, and Customer agrees to accept the Work upon its successful completion by Contractor in accordance with the Contract and pay the Contract Price pursuant to Article 5.

Unless explicitly excluded, any and all labor, materials, supplies, equipment/tools, transportation, supervision, technical, professional and other services that may be necessary to complete any part of the Work shall be provided by Contractor without additional cost to Customer.

2.3 Contractor's responsibility in the performance and execution of the Work comprises technical data/documentation and the supply of the Contract Line Items in compliance with the Contract. Contractor shall provide all the Contract Line Items and perform the tasks stated in the Contract to ensure that the Work, when executed, completed and presented for acceptance, shall comply with all the requirements set forth in the Contract.

2.4 Contractor shall perform the Work and deliver to Customer the Contract Line Items pursuant to the terms and conditions of this Contract, including without limitation all specifications/requirements and/or standards referenced in, required by or developed under the Contract.

In case of any conflict between the abovementioned specifications/requirements and/or standards, Contractor shall, within thirty (30) days from the date such conflict is known or other period as may be agreed upon by Customer, provide written explanation, with relevant technical information, and the parties shall discuss the resolution of such conflict based on common industry practice and the purpose of the Contract.

2.5 Contractor shall perform the Work, within the estimated period of forty (40) months after the CED, in accordance with the schedule defined in Section 5 Milestones of Appendix II, SOW and on the terms and conditions of this Contract.

Article 3
Quality Management, Assurance and Inspection

3.1 General

3.1.1 Contractor represents and warrants that it has the required skills, specific knowledge, ability and experiences necessary for the performance of the Work and undertakes to use such skills, knowledge, ability, ingenuity and due diligence in the implementation of the Work. Contractor further undertakes to perform the Contract with the industry standards and warrants that the Contract Line Items to be produced and delivered shall be of quality and conform to all design and manufacture requirements set forth in the Contract.

3.1.2 Customer's observation on any quality assurance procedures, inspection or technical review pursuant to this Article 3 and any approval or countersigning by Customer of any technical document, inspection report or certificate in respect of any part of the Work shall not release Contractor's responsibilities for the final completion of the Work in accordance with the Contract.

3.2 Quality Assurance and Inspection

3.2.1 Contractor shall implement and maintain a quality system that satisfies program objectives, including reducing risks in the areas of schedule and performance, and that meets the requirements of ISO 9001 or an equivalent quality system model. A summary of the quality system, identifying all major processes and elements that are considered key to meeting program objectives, shall be made a part of the required master plan. The quality assurance procedure shall be conducted independently by Contractor's qualified quality control personnel who shall not be directly responsible for the design, manufacture or provision of the Contract Line Items.

3.2.2 All tests, qualifications, validations or demonstrations of the Contract Line Items shall be solely for the interest of Customer. Except as required under the Contract, Contractor shall not use any Contract Line Items or any part thereof for any test, qualification, validation or demonstration that is excessive and causes unnecessary depreciation or wear and tear.

3.2.3 Contractor shall maintain technical/management documentation, objective evidence and quality records on file throughout the contract performance period. Customer shall have the right to review and inspect Contractor's technical/management documentation, pertinent data, objective evidence, quality records, technical reports, meeting minutes and the like, related to the analysis, design, development, fabrication, testing, quality assurance, installation and integration efforts performed under the Contract. Contractor shall upon Customer's request provide, at the Contractors facility for viewing or in other manner as mutually agreed, the inspection/analysis reports, evaluation/failure analysis data, test data sheets and records, test plans, procedures and reports, or give insight to the abovementioned documents if which are not deliverables in accordance with the subcontractor's specification, in support of the test and demonstration requirements.

3.2.4 Customer has the right, but not the obligation, to have any of Customer's authorized representatives to observe the entire or any part of the inspection and quality assurance procedures conducted by Contractor or its subcontractors at Customer's cost, provided that such observation be requested with advance notice to and coordination with the Contractor. In principle, observation by the Customer's authorized representatives shall be conducted annually, but the parties may agree to adjust the frequency or to have an ad hoc observation. The Customer's authorized representatives who visit the Contractor's or its subcontractors' site or have access to the information or documents prepared by the Contractor or its subcontractor should observe the Contractor's or its subcontractors' confidentiality and safety requirements, as relevant. The observation by Customer shall not, under any circumstances, be constituted against the Customer as acceptance of any of the Contract Line Items and release the Contractor from any quality assurance obligation. For clarity, Customer’s authorized representatives

shall have access only to information and documents associated with this Contract and SOW and shall not have any access to Contractor's or its subcontractors' financial information.

When a quality problem exists with, or will potentially arise from (based on a Customer process or documentation review), any Contract Line Items, Customer may forward a "Corrective Action Request" to Contractor, requiring its timely response. Contractor's response shall include at least the following information: analysis of the cause of the problem, statement of the action taken to prevent recurrence and the effect of the action.

3.2.5 Customer may, with prior written notice to Contractor, designate a third party who participates in the Project to act on its behalf to observe the entire or any part of any inspection or quality assurance procedures associated with this Contract and SOW. Customer shall cause such third party to undertake that the information provided by Contractor shall be kept in confidence pursuant to Article 11. A Non-Disclosure Agreement will be entered into by Customer and the third party to protect the proprietary interests of Contractor. The Customer shall identify such third party in the end use statement (or updated end use statement) in a timely manner to allow Contractor to apply for and obtain the required export permits, if any. If Contractor has concerns about the protection of its due business interest with respect to any third party designated by Customer, then the parties shall discuss the Contractor's concerns in good faith and mutually agree on a way forward.

3.2.6 Contractor shall ensure that its subcontractors comply with the requirements set forth in Article 3.2.1, with exception to lower-tier suppliers that are providing off-the-shelf products, components and materials.

3.2.7 Whenever the Contract provides the Customer and/or its representative with access to the Contractor’s facility, the Customer understands and agrees that i) access will be in accordance with applicable export regulations and Contractor's security and health and safety policies, ii) access will be during normal business hours and on a non-interference basis, and iii) Customer and and/or its representatives will be escorted by Contractor employees while at the Contractor's facility.

3.3 Technical Reviews

3.3.1 Contractor and Customer shall conduct review(s) for which each party is assigned responsibility according to Appendix II SOW. Each responsible party shall prepare and present all necessary data and documents for the reviews and prepare a report of each review. Each responsible party, with the assistance of the other party, shall prepare the agenda and minutes of each review meeting.

3.3.2 Reserved

3.3.3 For technical information, data, plans, procedures, documentation, specifications and reports that are subject to Customer's approval, Contractor shall, upon receipt of Customer's rejection stating the reason for rejection, promptly make revisions and resubmissions for approval. Upon completion of corrections/revisions of unfinished items, Contractor shall again submit the same to Customer's Project Manager for review and approval. With respect to the second or subsequent submission, Customer's Project Manager shall inform Contractor in writing of their approval or request further a correction or revision. Unless another timeframe is specified in the relevant Contract documents, Customer's review and approval or rejection should be completed within thirty (30) days after receiving Contractor's relevant submission. For clarity, if delivery of any of the Contract Line Items is delayed due to Customer's rejection, review or request for further correction or revision of Contractor's submission(s), such delay should be considered attributable to the Contractor. If Customer does not accept or reject such technical information, data, plans, procedures, documentation, specifications and reports within the prescribed timeframe, then Customer shall be deemed to have accepted the respective technical information, data, plans, procedures, documentation, specifications and reports, unless the Customer has requested clarification or additional time to review the submission.

Article 4
Progress Review and Acceptance

4.1 General

4.1.1 Upon completion of the relevant activities and tasks pursuant to Appendix II SOW, document submittal pursuant to Appendix III Data Deliverables, and successful completion of tests and inspections pursuant to Appendix II SOW, Contractor shall present the Contract Line Items to Customer as stated in this Article 4.

4.1.2 For shipment of any deliverable Contract Line Items, including any repaired or replaced items, Contractor shall sign a Certificate of Conformance ("COC") in form of Exhibit B, assuring that the items shipped conform to the requirements of the Contract and are correctly packaged, packed and marked. Within ten (10) working days of the arrival of the shipped items at TASA Jobsite, Customer shall conduct a visual inspection of the shipped items to ensure that such items were properly delivered. If any damage, shortages, discrepancies, nonconformity, misidentified or misdirected products, etc. is found, Customer shall inform the Contractor within ten (10) days after the arrival of the shipped items and Contractor shall promptly provide repair or replacement at its own cost and responsibility, including transportation and insurance cost from and to TASA Jobsite. Notwithstanding the foregoing, if the Contract Line Item is lost or damaged at the TASA Jobsite, TASA shall be responsible for the risk of loss of or damage to the Contract Line Item in accordance with Article 6.2.

4.1.3 Contractor shall tender to Customer for acceptance only the Contract Line Items that have been inspected in accordance with the quality system and have been found by Contractor to be in conformity with Contract requirements. Inspections and tests and/or acceptance of the Contract Line Items by Customer do not release Contractor from its responsibility for defects or noncompliance with Contract requirements.

4.1.4 Customer has the right either to reject or to require correction of nonconforming delivered Contract Line Items within the respective warranty period defined in Article 9.2. Contract Line Items are nonconforming when they are defective in material or workmanship or are otherwise not in conformity with Contract requirements. Customer may reject nonconforming products, and Contractor shall, at its discretion, repair or replace the nonconforming products.

4.1.5 Contractor shall be responsible for the shipping costs of the rejected Contract Line Items. Contractor shall be responsible for the shipping costs of the Contract Line Items required to be corrected if correction requires return to Contractor or its subcontractors. However, Customer may require or permit correction in place, when technically feasible and promptly after notice, by and at the expense of Contractor. Contractor shall not tender for acceptance corrected or rejected Contract Line Items without disclosing the former rejection or requirement for correction, and, when required, shall disclose the corrective action taken. For clarity, Customer shall remove the rejected Contract Line Items from the higher-level assembly.

4.1.6 If Contractor fails to replace or correct the rejected Contract Line Items that are required to be replaced or corrected within the period of time prescribed by the Customer (which shall be reasonable and take into consideration the overall Project schedule), Customer may terminate the contract, in whole or in part, for default according to Article 18.3.

4.2 Acceptance of Equipment

4.2.1 For Contract Line Items (CLIN 1, CLIN 2, CLIN 3 and CLIN 4) procured under this Contract, according to Appendix II SOW and Appendix IV ACP, upon completion of the respective tasks, document submittal, delivery and required activities conducted by Customer, Contractor shall, in form of Exhibit B, issue to Customer a COC for each CLIN. Customer shall, within sixty (60) days of receipt of a COC, either countersign the COC without unreasonable delay, or state the items that do not comply with the

requirement of the Contract. In such event of noncompliance, Contractor shall make corrections within the period of time as may be prescribed by the Customer (which shall be reasonable and take into consideration the overall Project schedule) and shall be responsible for any resulting schedule impact if it fails to make the correction within the prescribed period.

Countersignature of a COC by Customer shall constitute Customer's acceptance of the Contract Line Items that the COC indicates.

If Customer fails to countersign or state the noncompliant items within sixty (60) days of receipt of a COC, then the delivered Contract Line Item shall be deemed to have been accepted by Customer and the respective COC shall be deemed to have been signed by Customer.

4.2.2 For any replaced and repaired items, Article 4.2.1 shall apply when returning the items for replacement or repair.

4.3 Upon successful completion of all the service tasks and document submittal for CLIN 5 and CLIN 6 pursuant to Appendix II SOW and Appendix IV ACP, Contractor shall issue to Customer a Service Completion Certificate ("SCC") in form of Exhibit C. Customer shall, within thirty (30) days of receipt of a SCC, either countersign the SCC without unreasonable delay, or state the items that do not comply with the requirement of the Contract. If Customer fails to countersign or state the noncompliant items within thirty (30) days of receipt of a SCC, then the SCC shall be deemed to have been signed by Customer.

4.4 For the purpose of effecting payment pursuant to Article 5.3, after completion of all tasks and document submissions required pursuant to Appendix II SOW and Appendix IV ACP for each milestone and conclusion of the progress review meetings required for the corresponding milestone, Contractor shall issue a Milestone Completion Certificate ("MCC") in form of Exhibit A, certifying that all required milestone tasks, inclusive of all preceding milestone tasks, have been completed. Customer shall, within ten (10) days of receipt of an MCC issued by Contractor, either countersign the MCC to certify the completion of the relevant milestone or, in the event that Customer believes Contractor has not satisfactorily completed all of the items covered by the relevant MCC, refuse to countersign and provide the Contractor with a written statement explaining the basis for its refusal. The parties shall discuss and cooperate in good faith to promptly resolve any such disagreement. If Customer fails to countersign or refuse to countersign the MCC within ten (10) days of receipt of an MCC issued by Contractor, then the MCC shall be deemed to have been signed by Customer.

4.5 Upon successful completion by Contractor of all tasks provided in the Contract, excluding the warranty work pursuant to Article 9, Contractor shall sign an All Work Completion Certificate ("AWCC") in form of Exhibit D, which shall be countersigned by Customer after the completion of the acceptance. If Customer believes Contractor has not satisfactorily completed all of the items covered by the AWCC, Customer shall have the right to refuse to countersign the AWCC, in whole or with regard to any particular item or combination of items, and shall provide Contractor with a written statement without unreasonable delay explaining the basis for its disagreement. The parties shall discuss and cooperate in good faith to promptly resolve any such disagreement.

Article 5
Contract Price and Payment Terms

5.1 Contractor represents that it has provided complete and accurate pricing data to establish the reasonableness of the pricing and that the prices charged for the any part of the Work are not higher than those charged to any other customer for supplies of a substantially similar nature, including quantities, technical performance and commercial terms.

Should Customer request a change, replacement and/or additional items pursuant to the Contract, Contractor shall provide pricing, schedule adjustment (which should be proposed by taking into consideration the overall Project schedule whenever possible) and data based on the requirements stated in Appendix I, Contract Line Items Price Breakdown. If the additional items requested by the Customer are not listed in Appendix I, the parties shall negotiate in good faith and mutually agree on the price and schedule (taking into consideration the overall Project schedule) for the supply of such additional items.

5.2 Contract Price

5.2.1 In consideration of Contractor's performance of the Contract, Customer agrees to pay a sum of [●] ([●]) as the Contract Price, with the breakdown as detailed in Appendix I Contract Line Items Price Breakdown.

5.2.2 The listing of the breakdown prices in Appendix I Contract Line Items Price Breakdown shall under no circumstances be interpreted as the parties' intention to provide or accept the Work partially, except as agreed to in accordance with Section 8.5 herein, or, in the event of default by Contractor, to calculate the damages based on such prices.

5.2.3 The Contract Price shall be firmly fixed and subject to no adjustment, unless amended pursuant to Article 22, with an understanding that the application of service CLIN 6-3 and its corresponding price payment is contingent on the result of the launch, as further described in SOW.

5.2.4 Except as otherwise stated in the Contract, the Contract Price includes all costs, expenses and profit of Contractor to perform/deliver the Work and to fulfill all its obligations specified in the Contract, including, but not limited to, the costs of establishing the PB, as well as the taxes to be included in the Contract Price pursuant to Article 17.

5.3 Payment Terms

5.3.1 For Contract Line Items procured under this Contract, Customer shall, in accordance with the table in Section 1 of Appendix V Payment Schedule, make payments when the conditions of each payment are met. Each payment will be made within thirty (30) days after Contractor's presentation of the invoice and document as set forth in Section 2 of Appendix V Payment Schedule. If Customer believes payment conditions are not met, Customer may withhold payment which it believes the payment conditions are not met and shall provide a written statement by the above payment deadline, explaining the basis for such decision. The parties shall discuss and cooperate in good faith to promptly resolve any such disagreement. Customer shall advise Contractor within fifteen (15) working days of the date of the invoice if there is an issue with the invoice and/or documents.

If Customer believes there is any outstanding payment receivable from the Contractor, it may offset such amount receivable against any amount payable under this Article 5.3.1.

5.3.2 The Contract Price other than the withholding by the Customer as required under applicable tax laws, shall be paid by Customer in (currency) through telegraphic transfer to the bank account of Contractor as indicated below:

Bank Name

Address:

Phone:

Account:

IBAN

BIC

5.3.3 Customer shall have no obligation to effect any payment prior to the scheduled payment date pursuant to Appendix V Payment Schedule, irrespective of any early achievement by Contractor in advance of the scheduled date.

5.3.4 Any payment requested by Contractor during the transitional period (January 1st to March 15th) of each fiscal year shall be made by Customer no later than 10 days after March 15th.

5.4 Performance Bond ("PB")

To guarantee the performance of the Contract, as well as fulfillment of the conditions of Contract effectiveness pursuant to Article 21.1, Contractor shall submit, at its own cost, an irrevocable standby letter of credit (or bank letter of Guarantee) in form of Exhibit G as the PB, for an amount equal to five percent (5%) of the total Contract Price. The PB in favor of Customer shall be issued or confirmed by a bank authorized by the Taiwan ROC government to operate in Taiwan. All banking charges in relation to the PB shall be borne by Contractor. Other instruments for PB submission will only be acceptable upon Customer's prior written consent. The PB shall be delivered by Contractor to Customer within four (4) months after the contract has been signed by both parties to effect the Contract.

The PB shall be valid until at least three (3) months after the scheduled date of the AWCC. If there is any extension of the Contract schedule or performance delay, Contractor shall, no later than thirty (30) days prior to the expiration of the PB, have its validity extended by a period of time reasonably determined by Customer to reflect the extension period or the estimated delay period, or Customer shall have the right to collect the PB before its expiration. If the PB needs to be extended due to delays in the AWCC for reasons attributable to Customer, then Customer shall reimburse Contractor for all additional costs associated with extending the PB.

5.5 Offset, Bond Collection and Extension

If there is any outstanding payable by Contractor, including but not limited to damages, liquidated damages, refunds or reimbursements pursuant to the terms of the Contract, Customer may at its sole discretion offset such amount receivable against any amount payable under Article 5.2 or collect such amount receivable from the PB. For the avoidance of doubt, Customer's abovementioned right to offset the said outstanding payable by Contractor does not prevent Contractor from challenging the existence and amount of such outstanding payable through the dispute resolution procedure provided under Article 24.

Subject to the Customer's abovementioned right to offset, if Customer fails to make any required and undisputed payments within the payment terms defined in Article 5.3 and fails to rectify such failure within thirty (30) days after receiving notice from Contractor, then Contractor may at its sole discretion suspend the Work in relation to the unpaid payment until such time the Contractor has received the past due amounts in full. Any impact to the schedule resulting from the Contractor's aforesaid suspension of Work should be considered as excusable delay. In addition, Customer's payment of an invoice after the defined payment terms shall be subject to interest calculated at two percent (2%) above the commercial lending rate offered by the Bank of Taiwan.

Article 6
Care of Property

6.1 All components, materials and/or other hardware that are acquired, produced or designated for the Contract shall be identified for use under the Project. During the performance of the Contract and prior to the transfer of title and risk pursuant to Article 6.2, Contractor shall assume the risk of loss or damage and be responsible for the care of all such items. Contractor shall have the same be adequately protected and stored in accordance with the manufacturer's and/or Contractor's standard practices.

6.2 Subject to the provisions of Article 9 Warranty, the risk of all delivered materials, parts, components, units and equipment/tools shall transfer to Customer upon their arrival and unloading at TASA Jobsite in accordance with DPU INCOTERMs 2020 terms, while the titles shall transfer to Customer upon Customer's acceptance of the delivered items, as evidenced by its countersigning the corresponding COCs. Such transfer shall not be construed as relieving Contractor of its responsibility for the successful completion of the Work or the restoration of any design discrepancy.

Article 7
The Parties Personnel

7.1 Customer's Personnel

After signing the Contract, Customer shall designate a Project Manager and a Contracts Manager as follows. The Project Manager shall act on behalf of Customer in overall project management, and the Contracts Manager shall act in all contracting actions.

Dr. Celia Chen, Project Leader, Beyond 5 Generation (B5G) Mission

Ms. Hsueh-Lun Tung, Contracts Manager

7.2 Contractor's Personnel

7.2.1 Contractor shall designate qualified personnel, with adequate experience in the successful completion of assignments of a similar nature and scope, to carry out the Work.

7.2.2 Contractor's personnel shall have a good command of English or Chinese and be able to communicate with Customer's personnel using English or Chinese.

7.2.3 Contractor shall be responsible for all costs and liabilities resulting from any wrong or incomplete instructions or advice given by Contractor's personnel in the performance of the Contract, provided that such instruction or advice is communicated in writing and by the Contractor's authorized representative.

7.2.4 During the performance of the Contract, each party shall, whether required by law or otherwise, keep its personnel and properties insured against all risks and hold the other Party harmless from and indemnify and defend the other Party against claims, losses, liabilities, damages, expenses or costs arising from or related to the negligent or intentional activities of the personnel engaged by it for purposes of the Contract.

7.3 Accommodation and Access

7.3.1 Customer shall provide Contractor's designated personnel with access to its premises, including the TASA Jobsite, necessary to carry out the Contract. Such access shall be governed by relevant governmental security requirements. Copies of the relevant requirements shall be provided to Contractor fifteen (15) days prior to the designated personnel's arrival at Customer's premises.

7.3.2 Each party shall be responsible for the timely obtaining of the visas, permits and/or governmental approvals necessary for the performance of their duties under the Contract. Each party shall assist the other party's personnel in obtaining such visa, permits and/or governmental approvals.

7.3.3 Subject to applicable export regulations and Contractor's or its subcontractor's security policies (as the case may be), Contractor and/or its subcontractor shall provide access to its own premises for Customer's designated personnel to carry out the tasks defined within this Contract at no additional cost to Customer.

Article 8
Shipment and Marking

8.1 The deliverable Contract Line Items shall be delivered to Customer on DPU TASA Jobsite. For the local contractor, the deliverable Contract Line Items shall be delivered to TASA Jobsite directly. Documentation shall be delivered electronically in a medium as stipulated in the Appendix III Data Deliverable or as mutually agreed by the parties, and delivery shall be deemed to have been made on the date the document was uploaded to such medium. If specifically stated in the SOW, documentation may also be provided in hard copy, with DPU TASA Jobsite delivery terms.

8.2 For the foreign Contractor, Customer shall obtain import permit and customs duty/tax exemption from Taiwan ROC government authorities, and Contractor shall be responsible for customs clearance for the imported Contract Line Items. Contractor shall provide Customer a pro forma invoice at least forty-five (45) days prior to shipment to enable Customer to apply for exemption of such import duty/tax.

Other than delivery of CLIN 1, CLIN 2, CLIN 3 and CLIN 4, if Contractor needs to bring to Taiwan any items for use during the term of the Contract, Contractor shall submit a certificate to Customer certifying that the items to be imported to Taiwan shall be strictly used for the Work, and shall not be sold, rented or conveyed to others and used for other purposes. Contractor shall be responsible for any consequence resulting from its breach of such certification and shall hold Customer harmless against any loss or liabilities unless such breach is attributed to actions or inactions by Customer.

8.3 Contractor shall be responsible for handling international/inland transportation of the deliverable Contract Line Item(s) to TASA Jobsite and bear all risks and relevant costs, including, but not limited to, international/inland freight, cargo insurance, duties, taxes, charges and customs clearance expense, loading and unloading fee, etc., until the transfer of risk pursuant to Article 6.2, it being understood that should Customer fail to obtain the customs duty/tax exemption of Article 8.2, the costs of the import duty/tax results shall be reflected with an equivalent amount of price increase to the Contract Price.

8.4 All deliverable Contract Line Item(s) shall be packaged and packed by Contractor for export in accordance with the requirements specified in the Contract or, in the absence of any requirement in the Contract, the applicable commercial standard for air-borne export shipment for equipment of a similar nature. Contractor shall protect the items from damage or deterioration under transportation conditions, which will involve multiple handling, extended storage and exposure to moisture during transit to the TASA Jobsite. The cost of package and packing are included in the Contract Price.

8.5 For a scheduled shipment required under the Contract, partial shipment shall be allowed with Contractor's prior written notice to Customer.

8.6 No later than five (5) days prior to a shipment, Contractor shall notify Customer of the planned shipment date, the number of boxes, the list of items to be shipped, the weight and volume of each box and special instructions regarding the care of the items. Contractor shall prepare all necessary shipping and export documents, including the shipper's export declaration.

8.7 Contractor shall be responsible for arranging transport by air from Contractor's facilities to TASA Jobsite. Any shipment from a third country or transshipment during the course of carriage shall be subject to Customer's prior written consent, with the exception of shipments going through the United States or Europe.

8.8 Contractor shall, when making any shipment, place the marking on the exterior of all containers and packages as may be designated by Customer, for which the Customer will coordinate with the Contractor to decide the details in light of general practice.

8.9 Contractor shall place on the exterior of each container or package shipped, in a watertight envelope, one (1) copy of the packing List and one (1) copy of the COC; and one (1) copy of the packing List and one (1) copy of the COC shall be packed inside each container or package.

Article 9
Warranty

9.1 Warranty

9.1.1 Contractor represents and warrants that as of the date of the execution of this Contract and for the entire term of the Contract, it is a corporation duly organized and existing under the laws of the country where its principal office is located, and it has taken all necessary corporate and other legal actions to authorize the execution, delivery and performance of the Contract.

9.1.2 Contractor warrants that all Contract Line Item(s) to be delivered under the Contract shall be free and clear of any security interest, liens, charges or other encumbrances. Contractor shall, upon breach of this warranty, take immediately actions to:

a. remove any title defect or encumbrance;

b. replace the equipment or parts thereof that are defective in title; or

c. provide such other remedy as is mutually agreed upon by the parties.

Failing any such remedy by Contractor, Customer may avail itself of any legal remedies, including the termination of the Contract Line Item(s) with title defect, as well as the relevant Contract Line Item(s) whose function or purpose shall be affected thereby pursuant to Article 18.3 and the recovery of all related expenses including, without limitation, the transportation and insurance costs against Contractor.

9.2 Contractor represents and warrants that all Contract Line Items and the parts, except those that are on a rental basis under the Contract, contained therein delivered to Customer shall be newly manufactured and not previously used in any manner and that the design, manufacture and test of the Contract Line Items shall be in accordance with the Contract requirements and any applicable specifications referenced therein or developed thereunder and that such design shall be sufficient and proper to carry out its intended purpose under the Contract.

Contractor provides a warranty as stated herein for the deliverable Contract Line Items, including any hardware and software, for the periods specified below, provided, however, that the warranty period shall not be limited to the specified periods if the defect is known to Contractor and is not disclosed to Customer.

a. for items of equipment procurement under CLIN 1, CLIN 2 and CLIN 4, starting from the date of the duly countersigned COC by Customer pursuant to Article 4.2 to the end of the CLIN 3's warranty period.

b. for items of equipment procurement under CLIN 3, twenty-four (24) months from the date of the last of the duly countersigned COC by Customer for CLIN 3-1, CLIN 3-2 or CLIN 3-3 pursuant to Article 4.2, or until the Intentional Ignition of the launch vehicle carrying the satellite associated with the Work, whichever occurs earlier. “Intentional Ignition” means the start of the ignition process of the launch vehicle for the purpose of the launch, which is the time at which the command signal is sent to the launch vehicle.

c. for any item(s) repaired or replaced under this warranty, (i) six (6) months from the date of COC countersignature by Customer evidencing its conformance in all respects with the Contract requirements or (ii) the remaining warranty period extended by the days from Customer's notice of Nonconformity (as defined below) until the date of COC countersignature by Customer, whichever is longer.

Upon completion of all of Contractor's warranty obligations, a statement shall be signed by the Project Manager and issued to Contractor to certify that the warranty terms have been fulfilled by Contractor and the warranty period for all relevant Contract Line Items has expired.

9.3 Concerning CLIN 1, CLIN 2, CLIN 3 and CLIN 4, Customer shall, after the discovery of any defect, deficiency or discrepancy (herein referred to as "Nonconformity") in design, workmanship or material of any component, part or software thereof, promptly give Contractor written notification. Such notification shall identify the Nonconformity involved, including supporting documentation, and specify the period of correction (acting reasonably and taking into consideration the overall Project schedule). Contractor shall take immediate actions to investigate the cause of Nonconformity and, within seven (7) working days of Customer's notice, either inform Customer in writing of the status or result of the investigation and the manner of handling the repair or replacement or completing the repair/replacement, including all necessary installation and test. Contractor's failure to report the investigation status or result within seven (7) working days or complete the repair/replacement within the period reasonably specified by Customer shall constitute a default.

9.4 Subject to Customer's consent, Contractor may return such nonconforming items to its facilities at its own cost and risk. Upon completion of the repair/replacement, Contractor shall, at its own cost and risk, deliver such items to TASA Jobsite. Contractor shall obtain all government approvals, permits and licenses necessary for the delivery to TASA Jobsite, it being understood that as concerns deliveries to Customer, the provisions of Article 8.3 shall apply. Upon arrival of the repair or replacement item(s), Customer may perform such tests as it might deem necessary to demonstrate that the Nonconformity has been corrected.

9.5 If Contractor fails to make corrections pursuant to the foregoing within the period prescribed by Customer, Customer shall be entitled to cancel the nonconforming items as well as the relevant item(s) whose function or purpose areaffected thereby pursuant to Article 18.3.

9.6 The warranty provided herein is not applicable to normal wear and tear or to any item that has been damaged due to causes attributable to Customer ,such as modifications, combinations, accidents, abuse, improper storage, improper handling, misuse, negligence, or any other act or omission of the Customer.

For clarity, the warranty shall not be voided by any use or test by Customer of the equipment or any part or module contained therein or repaired by Customer in compliance with Contractor's instruction or the standard or special maintenance procedures provided by Contractor.

9.7 Contractor represents and warrants that the data deliverables furnished to Customer shall correspond to the requirements set forth in the Contract. Within twelve (12) months of COC or SCC, as the case may be, if any data deliverables do not meet this requirement, Contractor shall, upon receipt of Customer's notice, promptly correct the discrepancy at its own expenses by furnishing corrected technical data and technical information within the reasonable period of time designated by Customer.

Any service performed by Contractor under a warranty claim shall not imply any rights by Customer or any fault or liability on the part of Contractor. If Contractor accepts the return of any allegedly defective deliverables or consents to examine any allegedly defective deliverables, no such acceptance or examination shall under any circumstances be construed as an admission with respect to any claim or of any fault or liability.

9.8 With respect to any Nonconformity not covered by the warranty or beyond the relevant warranty periods provided in Article 9.2, Contractor shall, within seven (7) days of Customer's request, submit a quotation for the repair, retrofit or replacement thereof, which shall be valid for ninety (90) days. Upon receipt of Customer's order, Contractor shall promptly correct, repair or replace the Nonconforming item(s).

9.9 THE WARRANTIES, OBLIGATIONS AND LIABILITIES OF CONTRACTOR EXPRESSLY PROVIDED IN THIS CONTRACT EXCLUSIVELY SET FORTH CONTRACTOR'S

WARRANTIES, OBLIGATIONS AND LIABILITIES WITH RESPECT TO ANY NON-CONFORMANCE OF THE DELIVERABLES WITH THE SPECIFICATIONS SET OUT IN THE CONTRACT OR ANY DEFECT OR FAILURE IN THE DELIVERABLES, OR PART THEREOF, OR ANY PRODUCT, PART, DOCUMENT, DATA OR SERVICE DELIVERED OR PROVIDED UNDER THIS CONTRACT, AND CUSTOMER RENOUNCES ALL OTHER RIGHTS, REMEDIES, WARRANTIES, GUARANTEES, OBLIGATIONS, REPRESENTATIONS AND LIABILITIES, EXPRESS OR IMPLIED, OF CUSTOMER WITH RESPECT TO EACH DELIVERABLE OR PART THEREOF, PRODUCT, PART, DOCUMENT, DATA OR SERVICE DELIVERED OR PROVIDED UNDER THIS CONTRACT, ARISING IN FACT, IN LAW, IN EQUITY, IN CONTRACT, BY CIVIL LIABILITY, UNDER STATUTE, UNDER WARRANTY, IN TORT OR NEGLIGENCE, OR OTHERWISE, INCLUDING: (A) ANY IMPLIED WARRANTY OR CONDITION OR TERM OF MERCHANTABILITY OR DESCRIPTION OR FITNESS FOR A PARTICULAR PURPOSE; AND (B) ANY IMPLIED WARRANTY OR CONDITION ARISING FROM COURSE OF PERFORMANCE, COURSE OF DEALING OR USAGE OF TRADE.

Article 10
Infringement

10.1 Each Party represents and warrants that it has legal rights in the techniques, know-how, data, methods, processes, formulas, procedures and the like (hereinafter referred to as "Technical Information"), whether or not covered by any patent, patent application or copyright that are relevant to the performance of the Work and that, subject to applicable export rules, it has the right and power to furnish the data deliverables and any technical documentation or report to the other Party.

10.2 If any Technical Information provided by Contractor or the use of any and all products, processes, articles of manufacture, supporting equipment, facilities or services furnished by one Party in connection with the Contract infringes any patent, copyright or legal right of a third party, the Party in receipt of the claim shall promptly notify the other party. The Party issuing the Technical Information shall take immediate actions to evaluate, defend and settle such claim and, if such claim is made against the other Party, the Party issuing the Technical Information shall provide the other Party all available information, assistance and authority to defend such claim. The Party issuing the Technical Information shall hold the other Party harmless and shall indemnify any damages or expenses incurred by the other Party in connection with such claim, including, without limitation, attorneys' fees. The Party issuing the Technical Information shall, at its own risk and expenses:

a. settle or defend such claim without causing any impact on the proper implementation of the Contract;

b. acquire for the other Party the right to use such Technical Information; and/or

c. replace or modify the Technical Information to avoid infringement.

It is specified that the Party sued or against whom the claim is otherwise made shall take no steps in the dispute with the third party, nor shall it reach a compromise or settlement, without the prior written approval of the other Party, which approval shall not be unreasonably withheld or delayed.

10.3 Contractor shall indemnify and hold Customer harmless with respect to any damage, cost and expense resulting from an infringement or claim of infringement of patent rights or any other industrial or intellectual property rights of any third party that may arise from Customer's use of any Work performed by Contractor under this Contract; provided however, that this indemnification shall not apply to an infringement of rights as set forth above that have been mainly caused by an infringement of a right of a third party for which Customer is liable pursuant to Article 10.4. In addition, the indemnification shall not apply to an infringement caused by (i) any changes to the deliverable Contract Line Items made by or on behalf of Customer except for changes implemented by, on behalf of or with the approval (not to be unreasonably withheld or delayed) of the Contractor; (ii) the use of the deliverable Contract Line Items by or on behalf of the Customer in a manner that is not contemplated by this Contract or that does not comply with the requirements specified in the documentation furnished by the Contractor; or (iii) the use of Contractor’s intellectual property/confidential information outside the licenses provided under this Contract.

10.4 Customer shall indemnify and hold Contractor harmless with respect to any damage, cost and expense resulting from an infringement or claim of infringement of the patent rights or any other industrial or intellectual property rights of any third party arising out of or relating to Customer with respect to the design or manufacture of the satellite in association with this Contract, or Contractor's compliance with specifications furnished by Customer.

10.5 In the event that both parties shall be the subject of the same court action or the same proceedings based on alleged infringements of patent rights or any other industrial or intellectual property rights of a third party pursuant to both Articles 10.3 and 10.4 hereof, the parties shall jointly assume the defense and shall bear all damages, costs and expenses pro rata according to their respective liability. In the event

of any problems in implementing the pro rata allocation of the amounts referred to in the immediately preceding sentence, the parties shall undertake to resolve such problems in good faith.

Article 11
Proprietary Rights and Licensing

11.1 Proprietary Rights

11.1.1 Customer agrees that its use of any Contractor-supplied technical information might be subject to restrictions stated in the governmental approvals and/or export licenses submitted by Contractor.

Without limiting the restrictions above, Customer shall have the non-exclusive licensed right to use, free of additional charge from Contractor, any technical information contained in the products or data deliverables and furnished by Contractor according to the Contract, for the purposes of accepting, operating and maintaining CLIN 1, CLIN 2 and CLIN 3 delivered by Contractor pursuant to this Contract and for evaluating future projects. Notwithstanding the foregoing license grant, Customer shall not manufacture, reproduce or make derivatives (or have a third party perform the same on Customers behalf) same or similar products, reverse engineer or decompile Contractor products, nor publish or disclose any Contractor technical information or data deliverables in papers, scientific research, technical study or otherwise, without the Contractor's prior signed written consents (which may be declined by Contractor for commercial reasons or subject to a royalty-bearing agreement). The parties agree that the Contractor shall be under no obligation to provide Customer with technical information that is not identified as being a deliverable under the Contract.

11.1.2 Subject to the license rights granted to Customer pursuant to Article 11.1.1, Contractor shall retain sole and exclusive ownership of all technical information, intellectual property, trade secret and proprietary information conceived, developed or produced by it before or beyond its performance of the Contract, including as manifested or embodied within Contractor's products, deliverables and technical information delivered pursuant to this Contract ("Contractor Background IP").

Customer shall retain sole and exclusive ownership of all technical information, intellectual property, trade secret and proprietary information that Customer delivers to Contractor for performance of this Contract, ("Customer Background IP").

Without limiting each Party's retention of its respective Background IP, any proprietary information developed by Contractor and paid for by Customer under the Contract that is specific to and solely for the performance of the Contract ("Project Specific IP") shall vest with Customer, provided however (1) any such proprietary information falling outside the Project Specific IP scope and (2) any Project Specific IP that is developed primarily based on or derivative of Contractor Background IP shall vest with Contractor. Customer hereby provides to Contractor a perpetual, irrevocable, royalty-free, sublicensable to multiple tiers, worldwide license to Project Specific IP that vest with Customer for the Contractor to use and commercialize in its own products and services.

Each Party represents and warrants that any use of such by the other Party as requested or instructed by the Party does not infringe the intellectual property or other rights of third parties.

11.1.3 For purposes of the Contract, "proprietary information" denotes all information that is disclosed hereunder by one Party to the other in connection with the Contract, provided that, when disclosed, such information is in written or other permanent form and is identified as proprietary by the originating Party by clear and conspicuous markings. Any information disclosed in any other form shall be considered proprietary only to the extent identified as proprietary at the time of original disclosure and thereafter summarized in writing and transmitted by the originating Party, with such clear and conspicuous marking, to the receiving Party within thirty (30) days of the non-written disclosure. Without limiting the foregoing, Customer agrees that technical information related to Contractor products and the intellectual property manifested or embodied within or by Contractor products is and shall remain the proprietary information of Contractor, subject to the Customer's licensed right to use such pursuant to the license granted by Contractor in Section 11.1.1.

For protection of the proprietary information received from the other Party, each Party shall exercise the same degree (which shall not be less than reasonable) of care in protecting its own information of like importance from unauthorized disclosure and use. Each Party shall limit access to the proprietary information of the other Party to those of its personnel with a need to know and shall preserve proprietary information received from the other Party in confidence. Notwithstanding the forgoing, either Party may disclose the other Party's proprietary information to its contractors, consultants, subcontractors and to its affiliates' personnel, contractors and consultants, who have a need to know for the purpose of the Work under this Contract and have a confidentially obligation to keep such proprietary information in confidence, provided, however, that the Customer agrees that it shall refrain itself from disclosing Contractor's proprietary information to a competitor of the Contractor . For the sake of this agreement, "Contractor's competitors" shall be defined as companies, organizations and/or institutions that, as based on publicly available information or as notified by the Contractor, provide software-defined communication systems and/or satellite communication user terminals at the time of the disclosure of the proprietary information in question, provided that the Taiwan companies assigned by TASA to develop Taiwan user terminals and verify with the communication Payload at TASA facility and in orbit, as described in and to the extent required for implementation of point 8 of the General Requirements of SOW, should not be considered as a Contractor's competitor subject to the disclosure restriction on the Customer.

11.1.4 The restrictions with respect to any proprietary information set forth in Article 11.1.3 shall not be applicable if the receiving Party can prove that the information received:

a. has come into public domain prior to the disclosure thereof through no wrongful act of the receiving Party;

b. is already known to or has been lawfully received by the receiving Party prior to the disclosure without restrictions;

c. is approved for release or use by signed written authorization of the disclosing Party;

d. has been developed by Customer, being the receiving Party, independent of Contractor or independently by Contractor, being the receiving Party, beyond the performance of the Contract;

e. the receiving Party can demonstrate was legally in its possession at the time of receipt; or

f. is required, but only to the extent necessary, to be disclosed to governmental or judicial body, in which event the Party concerned shall notify the other Party of any such requirement and the information required to be disclosed prior to such disclosure.

11.1.5 Upon termination/rescission of the Contract, each Party shall, upon the other Party's request, return to the other Party or destroy/delete all proprietary information furnished by the other Party and/or any information developed by the other Party in the performance of the Contract, and/or any documents, proposals, reports and/or plans containing such information that are in its possession for the performance of the Contract, subject to applicable export control laws and regulations, or destroy the same under the instruction of the other Party. Notwithstanding the foregoing, the receiving Party may retain such proprietary information as it is required to retain by law or for regulatory or compliance purposes (including any such information contained in board, executive or investment committee papers), or as a result of automated electronic data backup or archiving, and any such retained proprietary information will remain subject to the terms of this Article 11.

11.1.6 To the extent necessary for the performance of this Contract and subject to applicable export regulations, each Party shall be entitled to divulge to its own Related Third Parties, except for Contractor's competitors as defined in Section 11.1.3, the documents, data and written information received from the other Party or from the other Party's Related Third Parties in connection herewith, provided that such

receiving person shall have first agreed to be bound by the nondisclosure and use restrictions of this Contract.

"Related Third Parties" means any individual or legal entity, whether organized under public or private law, who or which shall act, directly or indirectly, on behalf of or at the direction of either Party to this Contract to fulfill the obligation undertaken by such Party pursuant to this Contract or invited by either Party to participate in performance of the Contract, including without limitation: (i) the parties' respective contractors and subcontractors at any tier that are involved in the performance of this Contract; (ii) the parties' respective directors, officers, employees, advisors and agents; (iii) any entity or person that is invited by the Customer to participate in the Project; or (v) the government agencies that have the authority under the applicable law to review, supervise or audit Customer's performance of the Contract. The Customer shall ensure that its Related Third Parties are identified in its End Use Statement (EUS), which is required for the Contractor to obtain any applicable export permit or authorization. Each Party shall reproduce the other Party’s proprietary rights notices on any such approved copies, in the same manner in which such notices were set forth in or on the original. The receiving Party shall promptly notify the disclosing Party upon discovery of any unauthorized use or disclosure of the disclosing Party's confidential information by the receiving Party or any of its Related Third Parties.

11.1.7 The provisions of this Article 11 shall survive the performance of this Contract and shall remain in full force and effect until said documents, data and written information become part of the public domain.

11.2 Licensing

Subject to the terms and conditions of this Contract, the Contractor shall grant the Customer a limited, non-exclusive, non-transferable (without the right to sub-license), irrevocable license to use the software embedded in and/or required for the Customer to fully utilize the deliverable Contract Line Items ("Software") solely in object code form. All other rights are expressly reserved by the Contractor.

The Customer shall not, directly or indirectly: (i) use, modify, incorporate into or with other software, or create a derivative work of any part of the Software; (ii) disassemble, decompile, reverse engineer, revise or enhance the Software or attempt to reconstruct or discover any source code or underlying ideas or algorithms of the Software; (iii) remove or otherwise alter any of the Contractor's trademarks, logos, copyrights, notices or other proprietary notices, if any, fixed or attached to the Software; or (iv) ship, transfer, or export the Software or any component thereof or use the Software in any manner contrary to the Contractor’s governing export regulations, for which Contractor should inform Customer and provide reference document in due course.

Article 12
Licenses, Permits and Compliance with Export Requirements

12.1 Contractor undertakes to obtain, or cause its subcontractors to obtain, and maintain its validity in full force during the period of the Contract, all applicable governmental approvals (including export license for ITAR electric parts), licenses, permits, authorizations and other clearances required for the Contractor's execution, delivery and performance of the Contract, in particular, the export license required for the delivery (and redelivery where necessary) into Taiwan of the Contract Line Items, data and documentation in connection therewith, and to undertake to obtain from time to time all such applicable governmental approvals required for any amendment, modification and/or extension thereof, all at Contractor's risk and expenses.

12.2 Each Party undertakes to fulfill all requirements prescribed in and to comply in all respects with the applicable laws, such as safety, health, environment protection, labor, and import and export laws and regulations relating to the execution, performance and delivery of the Contract, and all applicable governmental administrative acts pursuant to such laws and regulations.

12.3 The above obligations shall not apply if the Contractor cannot comply with these obligations due to a change of classification in export regulations after execution of the Contract. In this case, the parties will negotiate in good faith about necessary amendments to the Contract.

In order to enable the Contractor to fulfill its obligations prescribed in this Article, upon the Contractor's request, the Customer shall provide promptly to the Contractor all required information, including provision of the necessary documents or statements. Any delay in providing such required information shall be considered as excusable delay on Contractor's side.

12.4 Subject to Article 21.3, in the event a government approval is rejected, revoked and/or has restrictive conditions that limit the use of the Work due to no fault of the Contractor, then such rejection, revocation or restricted conditions shall be considered Force Majeure.

Article 13
Excusable Delay

13.1 Force Majeure

13.1.1 Any delay in or failure of performance by either party pursuant to the Contract (except the payment of money) shall not constitute default nor give rise to any claims for damages if and to the extent caused by Acts of God, acts of governments in its sovereign capacity, government regulations, the rejection/revocation/restricted conditions of export license (unless such rejection/revocation/restricted conditions was caused by an error or omission by the Contractor), riots, strikes or lock-outs relating to labor unions, warlike operations, revolution, war, fires, floods, earthquake, epidemics of contagious diseases, quarantine restrictions, sabotage, terrorism or other similar events (hereinafter referred to as "Force Majeure") that are not attributable to, and are beyond the control of the affected party. For the sake of clarity, it is understood by the parties that political threat, demand or pressure originating from any sovereignties or political power shall in and of itself, not constitute a Force Majeure event.

13.1.2 Failure to provide or inability to perform by Contractor's subcontractors shall not be considered as Force Majeure unless such failure or inability was caused by Force Majeure as defined in Article 13.1.1 and Contractor is unable to engage other subcontractors within reasonable time and expense.

13.1.3 The affected party shall immediately provide written notice, with evidence, to the other party of the causes of the Force Majeure and in any event within ten (10) days thereafter stating:

a. the nature, extent and expected duration thereof;

b. the impact (if reasonable determinable at such time) thereof on the Contract Schedule in particular and on the implementation of the Work in general; and

c. as applicable, a request for an extension of time resulting from such Force Majeure.

The affected party shall be entitled to an extension as may reasonably be required to remove or remedy the Force Majeure, provided that it has timely notified the other party and furnished evidence, which shall be confirmed by the other party. The extension of the Complete Date(s) shall be granted only when the above requirements have been satisfied.

13.1.4 The other party shall within ten (10) days of receipt of the notice from the affected party, reply in writing if the extension has been granted and indicate the acceptable period of extension, if any. The unaffected party may notify the affected party to extend the time to make the decision on granting the extension of time, if necessary.

13.1.5 The affected party shall take commercially reasonable steps necessary to remove the effects of the Force Majeure and to regain time lost and shall in no event discontinue or delay the performance of any obligations provided in the Contract not directly affected by the Force Majeure. Should efforts to remove the effects of the Force Majeure event(s) be unsuccessful, the parties will negotiate a reasonable termination for convenience in accordance with Section 18.1 of this Contract.

13.2 Customer shall be responsible for the timely provision of information as defined in the Contract and for the accuracy of such information. Contractor shall be entitled to claim an adjustment to the schedule of the Contract if Customer does not complete its obligations in a timely manner or if a defect/inadequacy in customer-furnished information impacts the Work.

Article 14
Liquidated Damages

14.1 Liquidated Damages for delays of procured equipment delivery.

14.1.1 Contractor acknowledges that if it delays in the delivery of CLIN 1, CLIN 2, CLIN 3 or CLIN 4, or in the performance completion of CLIN 5 or CLIN 6, Customer will suffer damage from such delay. If not caused by Customer and due to reasons not excusable pursuant to Article 13, Contractor agrees to pay Customer liquidated damages for the CLIN for which actual delivery or performance completion date occurs latter than that provided in the schedule as stipulated in Section 5 Milestones of Appendix II SOW. The liquidated damages for late delivery or performance shall be calculated by a sum in the amount equal to zero point zero five percent (0.05%) of the contracted price for per day of the delayed CLIN starting thirty (30) days after the delivery or performance completion date stipulated in the Section 5 Milestones of Appendix II SOW. The cumulative liquidated damages that Contractor is liable shall in no event exceed five percent (5%) of the Contract Price.

A deadline for corrections by Contractor regarding nonconforming delivered item of CLIN 1, CLIN 2, CLIN 3 and CLIN 4, may be prescribed by Customer during acceptance process of the delivered item of CLIN 1, CLIN 2, CLIN 3 and CLIN 4 in accordance with Article 4.2.1 and Article 4.2.2. Notwithstanding the latest completion date for correction prescribed by the Customer, Contractor is liable for the delay from the earlier of the delivery date provided in the delivery schedule as stipulated in Section 5 Milestones of Appendix II SOW and the prescribed latest completion date for correction. The calculation of liquidated damages is the same as in the first paragraph of this Article.

14.2 The liquidated damages shall become due and payable as indicated on the COC or SCC of the relevant CLINs, or otherwise notified by Customer in writing. Customer may deduct the amount of the liquidated damages from any payment due to Contractor pursuant to the Contract, call on the PB, or demand Contractor to pay within thirty (30) days from the due date. Contractor's payment of liquidated damages beyond thirty (30) days from the due date shall be subject to interest calculated at two percent (2%) above the commercial lending rate offered by Bank of Taiwan.

14.3 The assessment of the liquidated damages shall be without prejudice to Customer's rights as provided in Article 18.3. The liquidated damages defined in this Article 14 are fixed and not subject to adjustment. With exception to rights provided under Article 18.3, liquidated damages are the sole and exclusive remedy with respect to Contractor's delay in delivering or performing the Contract Line Items in accordance with the Contract.

Article 15
Liability

Save any liabilities arising from gross negligence, willful misconduct or infringement of intellectual property rights on the part of Contractor and/or Contractor's subcontractors/agents, Contractor's total liability arising from execution, performance (or default thereof), or termination or rescission of this Contract, whether based in contract, tort, law or other theory of liabilities, if any, shall not exceed in aggregate an amount equal to the total Contract Price as set forth pursuant to Article 5.2.1.

Save any liabilities arising from gross negligence, willful misconduct or infringement of intellectual property rights on the part of Customer, Customer's total liability arising from execution, performance or termination of this Contract, including the payment in consideration of Contractor's performance of the Contract but save the return of the PB, whether based in contract, tort, law or other theory of liabilities, if any, shall not exceed the total Contract Price as set forth pursuant to Article 5.2.1.

In no event shall either Party be liable for incidental or consequential damages.

Article 16
Gratuity and Commissions

16.1 Contractor warrants and represents that Contractor and its subcontractors shall not pay, give, promise or offer any bribe, kickbacks, rebates, commissions, or other inducements to any government officers or any employee, staff member, agent or representative of Customer, or other concerned party.

16.2 (a) Contractor represents and warrants that Contractor and its subcontractors shall not employ or retain any company or person other than its employees to solicit or secure the Contract, nor appoint any agent, representative or other person who has received or will receive a commission, percentage, or brokerage or contingent fee in connection with the Contract. It is, however, permissible that Contractor, by virtue of bona fide commercial arrangement, retain professional or other services and pay remuneration based on service rendered.

(b) Contractor further represents and warrants that neither itself nor any of its employees, representatives or agents or its subcontractor has exerted or proposed to exert improper influence to solicit or obtain this Contract. Improper influence as used herein means any influence that induces or intends to induce an employee or officer of the Customer, outside counsel or reviewers engaged by the Customer to participate in the tendering of this Contract, or a government officer who has supervising power over the tendering of this Contract in accordance with the applicable laws, to give consideration or to act regarding the Contract on any basis other than the merits of the matter.

16.3 Contractor shall ensure that its subcontractor for any portion of the Work comply with the requirements stated herein in this Article 16.

16.4 Should Contractor breach its obligations stated in this Article, or any of its representations stated herein in this Article 16 be found false, Customer shall have the right to either (i) terminate the Contractor pursuant to Article 18.3; (ii) rescind the Contract pursuant to Article 18.4 if such breach jeopardizes the legality of the Contract or the award thereof; or (iii) deduct from the Contract Price an amount equal to that of the commission or similar payment made or to be made that is in breach of Article 16.1 or Article 16.2 by Contractor or its subcontractors.

Article 17
Taxes and Duties

17.1 Any and all taxes, levies or charges that may be assessed to Contractor by any taxing authorities within or without the territory of Taiwan with respect to the efforts performed by Contractor or its subcontractors or their personnel shall be the responsibility of Contractor, except that payment of the Taiwan taxes shall be subject to Articles 17.2, 17.3.

17.2 Importation of the CLIN 1, CLIN 2, CLIN 3 and CLIN 4 into Taiwan is exempt from import taxes/duties, provided that Customer shall apply for tax/duty exemption prior to the equipment arrival, which requires Contractor's assistance pursuant to Article 8.2. For local contractor, all taxes levied by taxation authorities that are not in the purchaser's tax exemption of this contract pursuant to regulations of taxation authorities of Taiwan shall be the responsibility of local contractor.

17.3 For CLIN 5 and CLIN 6, there will be Taiwan Corporate Income Tax (3%) in addition to Contractor's net price. The final Contract Price will be the sum of Contractor's total net price and all Taiwan taxes.

17.4 If during the term of the Contract (including the changes in tax rate, taxable items or Taiwan tax regulations) there are, for whatever reasons, Taiwan taxes imposed on Contractor by the Taiwan ROC government for the Contractor's performance of the Contract, the Contract Price shall be amended to keep Contractor's total net price unchanged. The total net price is defined as the Contract Price less the total of Taiwan taxes imposed on Contractor by the Taiwan ROC government for the Contractor's performance of the Contract.

To comply with the Taiwan tax laws and regulations, Contractor shall present its invoices in a form that shows the net price, the applicable Taiwan taxes, and the total amount for each payment. Customer shall withhold Taiwan taxes pursuant to the relevant Taiwan laws and regulations. Customer shall pay the net price to Contractor in accordance with the provisions in Article 5.

17.5 The Taiwan ROC Stamp Tax Law requires that for contracts executed in Taiwan, each party shall pay the stamp tax by affixing on the original of the contract respectively held by them the stamps or the stamp tax receipt issued by the taxing authority, except where an exemption applies. For clarity, the Stamp Tax on Contractor's side, if to be paid, is on the Contractor's account and not included in the Contract Price to be paid by the Customer.

Article 18
Termination/Rescission

18.1 Termination for Force Majeure

18.1.1 If, due to the occurrence of Force Majeure event(s), the performance of the Contract has been delayed or a Party notifies the other that its performance can be expected to be delayed for ninety (90) days consecutively or aggregately, the non-affected party may, by serving no less than fifteen (15) days prior written notice to the affected party, terminate the Contract in whole or in part.

18.1.2 If Contractor suffers from a Force Majeure event and the Contract is terminated by Customer, Contractor shall without delay:

a. stop the Work so terminated by Customer; and

b. place no further purchase orders for materials, services or facilities to the extent of such termination.

18.1.3 For terminated Contract Line Item(s), Contractor shall be entitled to and may retain all the milestone payments that have been made or payable by Customer before the termination date in accordance with the table in Section 1 of Appendix V Payment Schedule with respect to such Contract Line Item(s). The Customer shall be released from any obligation of milestone payments, and Contractor shall be released from further performance, in either case in relation to the terminated Contract Line Item(s) for which the condition of payments has not been fully met upon or before the termination effective date.

18.1.4 Upon the effective date of the termination, Contractor shall submit the settlement report to Customer, specifying the amount remaining to be paid by the Customer in accordance with Article 18.1.3, and any amount owed to Contractor as a result of the termination shall be paid to Contractor within thirty (30) days from receiving Contractor's commercial invoice of the termination settlement. Within the same time limit, the PB or the portion of the PB corresponding to the value of terminated Contract Line Item(s), as the case may be, if not already expired and no outstanding issues that contractually entitle Customer to retain the PB need to be resolved, shall be released by Customer.

18.1.5 If the export license or any governmental approval required for the performance of the Contract is suspended, revoked, reduced or otherwise limited by the government of Contractor and/or its subcontractor for cause not attributable to Contractor and/or its subcontractor, and such export license or governmental approval is not reinstated within ninety (90) days of the suspension, revocation or reduction, Customer may terminate the Contract by serving no less than fifteen (15) days' written notice. In such event, Articles 18.1.2 through 18.1.4 shall apply.

18.2 Termination for Customer's Convenience

18.2.1 Customer may terminate the Contract in whole or in part by no less than seven (7) days' prior written notice specifying the extent to which performance of Work under the Contract is terminated and the date on which such termination becomes effective. Contractor shall without delay, or by the later date such termination becomes effective:

a. stop the Work subject to the termination; and

b. place no further purchase orders for material, services or facilities to the extent of such the termination.

18.2.2 Within sixty (60) days after the effective date of the termination, Contractor shall submit its claim for (i) all costs incurred up to the effective date of termination in respect of the portion of the Contract so terminated, plus (ii) all costs incurred after termination as a consequence of it (e.g., cancellation charges on issued purchase orders), plus (iii) a profit at the rate of five percent (5%), and (iv) any milestone

payments that are payable by Customer as of the termination date in accordance with the table in Section 1 of Appendix V Payment Schedule, provided, however, that the aggregate amount claimed by Contractor applicable to particular Contract Line Item(s) shall not exceed the price of the Contract Line Item(s) so terminated. The amount paid by Customer in excess of the value of Contractor's claim as set forth above shall be refunded to Customer, and any amount owed to Contractor as a result of such claim shall be paid to Contractor against Contractor's commercial invoice within thirty (30) days of the termination settlement.

18.2.3 Contractor's rights to claim the payment due by Customer as specified in Article 18.2.2 above are the exclusive remedies in relation to termination by Customer for convenience, notwithstanding any remedy otherwise available at law or in equity. The foregoing does not limit the rights and obligations of either Party under other provisions of the Contract that are unrelated to a termination for convenience.

18.2.4 All Work completed, Work in process, material parts, equipment/tools and all items procured or manufactured by Contractor under the Contract up to the effective date of the termination and which costs were captured in the Contractor's termination claim pursuant to Article 18.2.2 shall be delivered to Customer with the same rights and limitations as provided in Sections 11.1.1 and 11.1.2, or otherwise disposed of as Customer may direct, at the Customer's expense, unless such belong to Contractor.

18.3 Termination Due to Contractor's Default

18.3.1 Customer shall have the right to terminate the Contract for default, in whole or in part, upon occurrence of any of the following events:

a. Contractor commences a voluntary action pursuant to the bankruptcy law as now or hereafter in effect; or an involuntary action is commenced against Contractor in which the petition is not controverted or dismissed within three (3) months; or a custodian is appointed for, or takes charge of, all or any substantial part of Contractor; or Contractor commences any proceeding under any reorganization arrangement, adjustment of debt, relief of debtors, dissolution, insolvency or liquidation or similar law of any jurisdiction or any such proceeding is commenced against Contractor, which proceeding remains undismissed for a period of three (3) months or Contractor is adjudicated insolvent or bankrupt; or Contractor sells out its business in whole or in part and such materially affects its financial or technical ability to perform the Contract; or

b. Other than the late delivery or performance of a Contract Line Item, for which the consequences are provided separately in Article 14 and subparagraph d below, Contractor defaults on any material obligation provided in the Contract or any of its representations or warranties made in the Contract is found untrue or ceases to be valid (other than that otherwise provided under Article 16), in any case when such remains uncured for more than 10-days from written notice thereof;

c. The export license or any governmental approval required for the performance of the Contract is suspended, revoked, reduced or otherwise limited by the government of Contractor and/or its subcontractor for causes attributable to negligence or error of Contractor and/or its subcontractors/suppliers, and such export license or governmental approval is not reinstated within three (3) months of the suspension, revocation or reduction; or

d. The aggregated amount of the liquidated damages for delay assessed has reached the maximum in accordance with Article 14.1.1.

18.3.2 Upon occurrence of an event of material default as provided in Section 18.3.1, Contractor shall, upon written notice by Customer, within a reasonable timeframe of not less than 10-days, provide clarification and a cure plan for Customer's consideration. Customer may, at its sole discretion, accept or reject the cure plan proposed by Contractor. Subject to a formal resolution approved in writing by Customer,

Customer will suspend its otherwise available actions stated below. Should Contractor fail to promptly provide clarification and a cure plan or should Customer find such clarification or cure plan unacceptable, Customer may, after expiration of the applicable time period as stipulated in paragraphs a - c of Article 18.3.1, terminate the Contract in whole or in part and immediately proceed to avail itself of any and all appropriate remedies, including but not limited to demand refund of any and all payments made by Customer corresponding to those terminated part(s) of the Contract not yet performed up to the point of such termination (if any), and/or that were paid for defaulting performance by Contractor, claim damages suffered due to Contractor's default to the extent otherwise permitted by the Contract, and collect the foregoing from the PB and/or claim from Contractor for any such amount not secured by the PB.

Notwithstanding anything to the contrary herein, Customer shall remain obligated to pay Contractor for any non-defaulting performance provided and/or delivered up to the point of any termination. After Customer terminates the Contract for default, in part or in whole, Customer shall return any delivered nonconforming Contract Line Item(s) at Contractor’s expense, unless the parties agree otherwise.

18.4 Rescission of the Contract by Customer

18.4.1 Customer shall have the right to rescind the Contract, in whole or in part, upon occurrence of any of the following events:

a. It is confirmed that the Contractor knowingly made untrue statement or submitted forged documents during the tendering of this Contract, to the extent that the Contract was fraudulently induced by such untrue statement or submission of forged documents; or

b. The recession event described in Article 16.4

18.4.2 Upon occurrence of an event listed in the preceding subparagraph, Customer may rescind the Contract in whole or in part and immediately proceed to avail itself of any and all appropriate remedies, including but not limited to demand refund of any and all payments made by Customer corresponding to the rescinded part of the Contract (provided that the payments made for the CLIN(s) that the Customer otherwise accepts in accordance with the next paragraph will not be refunded), claim damages suffered due to Contractor's default, and collect the PB and/or claim from Contractor for any amount not secured by the PB.

If Customer rescinds the Contract, in part or in whole, Customer shall have the option to accept any delivered Contract Line Item(s). Should Customer opt to do so, Customer shall pay for the Contract Line Item(s) so accepted. Contractor shall at its own cost and risk remove, within a reasonable period of time, the Contract Line Item(s) not so accepted.

Article 19
Waiver of Breach

The failure of either party at any time to require performance by the other of any obligations provided in the Contract shall in no way affect the full right to require such performance at any time thereafter. The waiver by either party of a breach of any obligation provided in the Contract does not constitute a waiver of any succeeding breach of the same or any other obligations, nor shall it constitute a waiver of the obligation itself.

Article 20
Notices

20.1 Any notice required or permitted to be given pursuant to the Contract shall be given by personal delivery, certified airmail, express package service or facsimile (to be confirmed by a certified airmail or express package service) to the attention of the Project Manager designated by the parties at the address specified below. Notices sent by certified airmail shall be deemed to be given ten (10) days after certification. Notice sent by express package service shall be deemed to be given five (5) days after depositing with an express courier service. Notices sent by facsimile in conjunction with another form of delivery stated above shall be deemed to be given on the date of the additional form of delivery. Until changed by written notice given by either party to the other, the addresses of the parties shall be as follows:

Contractor:

Customer:

Taiwan Space Agency

8F, No. 9, Prosperity Road 1, Hsinchu Science Park, Hsinchu, Taiwan 30078

Telephone No.: 886-3-5784208 ext. 9553

Facsimile No: 886-3-5784246

Attention: Dr. Celia Chen, Project Leader, Beyond 5 Generation (B5G) Mission

E-mail: celiachen@tasa.org.tw

20.2 Each of the parties hereto shall inform the other party in writing of the identity of its authorized representative(s) who shall be empowered to sign on its behalf any document pursuant to the Contract. Subject to the language in section 27.1, regarding the role and responsibilities of the Coordinator, all notices and communications pursuant to the Contract shall be sent to the other party's authorized representative(s). Each party may change its authorized representative(s) by sending a thirty-(30-)day prior notice to the other party's authorized representative(s), signed by either the incumbent authorized representative(s) or by its senior management official.

Article 21
Conditions to Effectiveness

21.1 The Contract shall become effective ("Contract Effective Date" or "CED") when the conditions set forth below are satisfied:

a. the Contract has been signed by Contractor and Customer;

b. Performance Bond has been submitted to Customer pursuant to Article 5.4;

c. all applicable governmental approvals and/or export licenses necessary for the performance of the Contract are available at Contractor, or a notice of no governmental approvals and/or export licenses required for the performance of the Contract from Contractor is received by Customer.

21.2 Upon fulfillment of the conditions set forth in Article 21.1, Contractor shall issue and deliver to Customer a Contract Effective Date Certificate in the form of Exhibit E. Customer shall, upon confirmation of compliance, countersign and return it to Contractor.

21.3 In the event that the conditions set forth in Article 21.1 are not satisfied within four (4) months after signing of the Contract by both parties or an extended period as may be agreed upon by both parties, the Contract shall be considered null and void. In such event, each Party shall bear all costs and liabilities incurred by it. The Contractor shall be under no obligation to perform any Work under this Contract until such time the Contractor has received the countersigned Contract Effective Date certificate from Customer.

Article 22
Amendment

The Contract shall only be amended or modified in writing, signed by the authorized representatives of the parties. Oral direction will not modify or change the provisions of the Contract.

Article 23
Assignment

Neither party may assign part or the whole Contract without the prior written consent of the other Party, provided that Contractor may assign this Contract, as a whole, in connection with a merger, acquisition, reorganization or sale of all or substantially all of its assets. The foregoing shall not derogate from Contractor's right to subcontract part of the Work under this Contract, provided that the Contractor will remain responsible to the Customer for the subcontracted Work.

Article 24
Arbitration

24.1 All disputes, claims or controversies arising under or in connection with the Contract, or its interpretation or performance, shall be in writing and addressed to the other party pursuant to Article 20. The other party shall within thirty (30) days from the date of receipt of such notice submit its response. The parties shall exert their best efforts to reach an amicable settlement. Notwithstanding the foregoing, either party may at any time choose to petition for arbitration pursuant to Section 24.2.

24.2 Any dispute arising out of or related to the Contract that is not settled by amicable agreement between the parties shall be finally settled by arbitration referred to the Chinese Arbitration Association, Taipei (the "Association") in accordance with the Association's arbitration rules, by petition of either party. For Contractor being a Taiwanese contractor, however, the arbitration shall be conducted in the Chinese language. The arbitration shall be conducted in the English language and held in Taipei, Taiwan. Each of the parties shall appoint one arbitrator and the two so nominated shall, in turn, choose a third arbitrator. If the arbitrators chosen by the parties cannot agree on a choice of the third arbitrator within a period of sixty (60) days after their nomination, then the third arbitrator shall be appointed by the Association and serve as the chairman of the arbitration panel. The parties waive any objection to the matters stated in this clause on the grounds of inconvenient forum or otherwise. Any award rendered by such arbitration forum shall be conclusive, binding and enforceable upon the parties in any jurisdiction.

24.3 All information relating to or disclosed by any party in connection with the arbitration of any dispute relating to the Contract shall be treated by the parties and the arbitration panel as confidential information, and no disclosure of such information shall be made without the prior written authorization of the party furnishing such information.

24.4 The arbitration panel shall indicate in the award how to distribute the arbitrator's fees and arbitration expenses between the parties in accordance with what they deem just and equitable under the circumstances. Each party shall bear its own counsel fee incurred in connection with the arbitration.

24.5 The occurrence of any dispute and the submission thereof to arbitration shall not relieve Contractor of its obligations to continue performance of the Contract in good faith. Except in the case of non-payment by Customer in accordance with this Contract. If Customer is more than sixty (60) days delinquent in payment to Contractor, Contractor may stop work on CLIN(s) associated with non-payment, until such time as payment(s) have been brought current, provided however, that the Contractor shall be subject to the delay-related liabilities in accordance with this Contract for the delay caused by Contractor's stop of work if it is finally resolved that the Customer's non-payment is not a default.

Article 25
Applicable Law

The Contract shall be governed by and construed in accordance with laws of Taiwan, R.O.C.

Article 26
Contract to Remain Valid

26.1 Any provision of the Contract that is prohibited or unenforceable in any of the jurisdictions concerned shall be invalid only within such jurisdiction and to the extent of such prohibition or unenforceability without invalidating the remaining provisions of the Contract in such jurisdiction, and without affecting the validity or enforceability of such provision in any other jurisdictions concerned. The invalid provision shall, where appropriate, be modified in meaning or supplemented by the parties in such a way that the purpose contemplated under the Contract is achieved.

26.2 The obligations and rights of the parties, which by their nature extend beyond the expiration, termination or rescission of this Contract, shall survive expiration, termination or rescission of this Contract, including as provided in Articles 5, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28.

Article 27
Governing Language, etc.

27.1 Any technical documents and data furnished in accordance with the Contract, unless otherwise specified in the Contract, shall be written in the English language, or the Chinese language if Contractor prefers, and shall use the practices, standards and conventions in general use in the country where the Work is designed.

27.2 All notices and other communications pertaining to the Contract shall be in the English language, or the Chinese language if Contractor prefers.

27.3 Unless otherwise specified, when a period of time is stated in terms of number of days, it shall mean calendar days, including Saturday, Sunday and holidays, in accordance with the Gregorian calendar.

27.4 The headnotes and paragraph headings are inserted for convenience only and do not form part of the Contract and shall not be used as an aid in interpreting the meaning of any provision.

27.5 Customer shall notify Contractor in writing within 15 working days of any actions undertaken with respect to Exhibit F Power of Attorney.

Article 28
Entire Contract

Provisions contained herein or incorporated herein by reference constitute the entire Contract and supersede all previous communications or representations, either verbal or written, between the parties hereto with respect to the subject matter thereof.

IN WITNESS WHEREOF, Customer and Contractor have caused the Contract to be executed by their duly authorized officers or representatives as of the day and year indicated below. [The Contract is executed in one original copy, which is to be retained by TASA. A copy of the executed Contract will be certified by TASA and provided to the Customer. (17.5 Taiwan ROC Stamp Tax)]

Customer:
Taiwan Space Agency,

By: _____

Name Typed: Dr. JONG SHINN WU

Title: Director General

Date: [●], 2024

Place: Hsinchu, TAIWAN

Contractor:

By: _____

Name Typed: _____

Title: _____

Date: _____

Place: _____

EXHIBIT A. Milestone Completion Certificate

Pursuant to Contract No. TASA-P-1130160 (hereinafter referred to as the "Contract") between Taiwan Space Agency (hereinafter referred to as "Customer") and [●] (hereinafter referred to as "Contractor"), the undersigned, a duly authorized representative of Contractor, hereby certifies that the following tasks that are required for the [●] Milestone Payment have been completed in accordance with the Contract and that no default under the Contract has occurred or is continuing:

Date of Completion

Milestone Tasks

Scheduled Date

Actual Date

The successful completion date for the milestone shall denote the date on which this certificate is duly countersigned by Customer.

Contractor's Representative	Accepted by TASA
By:	By:
Typed Name:	Typed Name:
Title:	Title:
Date:	Date:

EXHIBIT B. Certificate of Conformance

Pursuant to Contract No. TASA-P-1130160 (hereinafter referred to as the "Contract") between Taiwan Space Agency (hereinafter referred to as "Customer") and [●] (hereinafter referred to as "Contractor"), the undersigned, a duly authorized representative of Contractor, hereby certifies that the Contract Line Item(s) to be shipped as described herein below conforms to the requirements of the Contract and are duly packaged, packed and marked.

Item Name

Item Description

Quantity

Package No.

Contractor's Representative	Accepted by TASA
By:	By:
Typed Name:	Typed Name:
Title:	Title:
Date:	Date:

EXHIBIT C. Service Completion Certificate

Pursuant to Contract No. TASA-P-1130160 (hereinafter referred to as the "Contract") between Taiwan Space Agency (hereinafter referred to as "Customer") and [●] (hereinafter referred to as "Contractor"), the undersigned, a duly authorized representative of Contractor, hereby certifies that all tasks, deliveries and services required under the Contract have been completed in compliance with the applicable provisions of the Contract.

The completion date for the Work shall denote the date on which this Certificate is duly countersigned by Customer.

Contractor's Representative	Accepted by TASA
By:	By:
Typed Name:	Typed Name:
Title:	Title:
Date:	Date:

EXHIBIT D. All Work Completion Certificate

Pursuant to Contract No. TASA-P-1130160 (hereinafter referred to as the "Contract") between Taiwan Space Agency (hereinafter referred to as "Customer") and [●] (hereinafter referred to as "Contractor"), the undersigned, a duly authorized representative of Contractor, hereby certifies that the Work as a whole, excluding the warranty work pursuant to Article 9, has been completed and is in all respects in compliance with the requirements set forth in the Contract.

The successful completion date of the Work shall denote the date on which this Certificate is duly countersigned by TASA.

Contractor's Representative	Accepted by TASA
By:	By:
Typed Name:	Typed Name:
Title:	Title:
Date:	Date:

EXHIBIT E. Contract Effective Date Certificate

Pursuant to Contract No. TASA-P-1130160 (hereinafter referred to as the "Contract") between Taiwan Space Agency (hereinafter referred to as "Customer") and [●] (hereinafter referred to as "Contractor"), the undersigned, a duly authorized representative of Contractor, hereby certifies that all the conditions to the effectiveness of the Contract as specified in Article 21 have been satisfied on [●]. Such date is the Contract Effective Date ("CED").

Contractor's Representative	Accepted by TASA
By:	By:
Typed Name:	Typed Name:
Title:	Title:
Date:	Date:

EXHIBIT F. Power of Attorney

We, [●], a corporation organized and existing under the laws of [●] and having its principal office at [●], hereby constitute and appoint the Taiwan Space Agency ("TASA"), to be our attorney-in-fact in Taiwan, the Republic of China, with full power of substitution and revocation, to file and prosecute on our behalf all applications for tax issues, including exemptions and/or special tax treatments, related to the B5G G2.0 Communications Payload System Procurement (Contract No. TASA-P-1130160), to make corrections, amendments and/or supplements, to conduct all procedures concerning same, and to receive service on our behalf of all documents and communications relating to these matters.

IN WITNESS WHEREOF, [●] has caused this instrument to be duly executed by its authorized representative, and its corporate seal affixed, in the city of [●] on the [●] day of [●], 2024.

Contractor:

By:

Typed Name:

Title:

Date:

P.S. This document has to be notarized and then legalized by the representative office of Taiwan ROC located in the place where the party issuing this document is situated

EXHIBIT G.

EXHIBIT G - 1 Model of Performance Bond

IRREVOCABLE STANDBY LETTER OF CREDIT

Irrevocable Standby Letter of Credit (See Note 1)	Credit Number
Place and Date of Issue	Date and Place of Expiry (See Note 2)
Applicant	Beneficiary
Advising Bank	Amount

Gentlemen:

We hereby issue our irrevocable Standby Letter of Credit No. [●] for the account of [●] (hereinafter referred to as "Contractor"), in favor of Taiwan Space Agency (hereinafter referred to as "Customer"), for an amount of [●], representing five percent (5%) of the Contract Price, as the Performance Bond required under Contract No. [●] (hereinafter referred to as "Contract") executed by and between Customer and Contractor, dated [●].

This Standby Letter of Credit may be drawn in whole or in part on or before the expiration date.

All banking charges, including confirmation fee, etc., in connection with this Standby Letter of Credit shall be for the account of Contractor.

Drawings under this Standby Letter of Credit shall be available at the counters of [●] (the ROC issuing or confirming bank) and payable two (2) business days after presentation of a simple receipt drawn on us, accompanied by a statement signed by Customer, stating that "Contractor has failed to comply with the terms of the Contract and an amount of [●] is due and payable to Customer under Article [●]" or "Contractor has failed to maintain the amount and/or validity of the PB as required by Article 5.4 of the Contract."

This credit is subject to the Uniform Customs and Practice for Documentary Credits ([●] Revision, International Chamber of Commerce, Paris, France, Publication No. [●])

_____
Authorized Signature

Notes:

1. The standby letter of credit shall be issued or confirmed by a bank registered in the Republic of China (Taiwan).
2. The place of expiry shall be indicated as "at the negotiating bank in Taiwan."

EXHIBIT G - 2 Model of Performance Bond

(BANK LETTER OF GUARANTEE)
UNCONDITIONAL JOINT AND SEVERAL GUARANTEE

We hereby issue this unconditional joint and several guarantee (the "Guarantee") for [●] (the "Contractor"), as Principal, in favor of Taiwan Space Agency (the "Customer"), as beneficiary, for an initial amount of [●] (as fulfillment of the conditions of Contract effectiveness), as the Performance Bond required under Contract No. [●] (the "Contract") executed by and between Customer and Contractor, dated [●], which is incorporated by this reference. The amount to be guaranteed hereunder may or may not be subject to an increase of up to a maximum aggregate amount of [●].

We, being the Guarantor of the Contractor, irrevocably and unconditionally undertake and promise to the Customer that if the Customer shall at any time and from time to time serve us a notice (a "Notice") demanding payment, accompanied by the document(s) specified below, then we shall upon such service pay to the Customer such amount as the Customer may demand in such Notice.

"Notice" means a certified statement signed by Customer, stating that "an amount of [●] is due and payable to Customer by the Contractor pursuant to Article [●] of the Contract."

We shall make payment to the Customer within two (2) business days of service of a Notice, by wire transfer to Customer to the account designated in such Notice: (i) without regard to any information or instructions that we may then have received or may thereafter receive from any other source, and we shall not be entitled to inquire into or require proof of any facts stated in the Notice that, as between us and the Customer, shall be conclusive; and (ii) notwithstanding any dispute between Contractor or Customer, and whether or not the Contractor or Customer is or might be under any liability to the other.

It being the intention of the parties hereto the event upon which payment must be made hereunder is the service from time to time of a Notice, irrespective of the underlying facts or their significance under the Contract, or any other agreement; and Customer may make multiple demands for payment until the full amount for which we are bound is drawn.

Our obligation to make payment shall not be affected by (i) the terms of and any obligations under any other agreement; (ii) any change in the business of, dealings with, or structure or composition of the Contractor, Customer and/or us; (iii) the modification of the time or manner for performance, by and/or the granting of any forbearance or indulgence on any account among the Customer and the Contractor; (iv) the failure to make demand upon any party, or to join any party in any proceeding, to recover any amounts due under this Guarantee; and/or (v) any change in the terms and conditions of the Contract, or any other agreement between the Contractor and the Customer.

No Notice demanding payment may be served under this Guarantee after (three (3) months from the scheduled expiry date of AWCC) ("Expiry Date"). Unless a Notice is served on us within the aforesaid period of validity, we shall be relieved and discharged from all liability hereunder, whether or not the original Guarantee is returned to us.

Moreover, no Notice demanding payment may be served under this Guarantee in the event that the Contract has been terminated pursuant to Article 18.1, or 18.2 thereof. In such event, this Guarantee shall no longer be valid, and we shall be relieved and discharged from all liability hereunder.

All Notices shall be served by the Customer on us by facsimile transmission to [●] (Guarantor's name and facsimile number) or by delivery by registered mail or courier to [●] (Guarantor's name and address), or in such other manner as may be agreed upon by the Customer and us. No change in address or facsimile number shall be effective unless agreed to by an officer of Customer in writing.

This Guarantee shall be governed by ROC law. Any dispute arising under or in connection with the Contract shall be finally settled by arbitration referred to the Chinese Arbitration Association, Taipei (the "Association")

in accordance with the Association's arbitration rules. The arbitration shall be held in Taipei, ROC, in accordance with the ROC Arbitration Law.

IN WITNESS WHEREOF, this Guarantee has been executed by the authorized representatives of the Guarantor and the Customer this [●] day of [●], 2024.

Appendix I

Contract Price Breakdown

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Appendix I Contract Price Breakdown

1. Price Summary

1.1 Price Breakdown of CLINs

Item	CLIN	Description	Price	Remarks
101	CLIN 1	One Set of Payload Engineering Design Unit (EDU)		
102	CLIN 2	Ground Test Equipment		Sum of Item 102-a, 102-b, and 102-c
102-a	CLIN 2-1	Two set of Ground Test Equipment 1		
102-b	CLIN 2-2	One Set of Ground Test Equipment 2		
102-c	CLIN 2-3	One Set of Ground Test Equipment 3		
103	CLIN 3	Payload System Flight Model (FM)		Sum of Item 103-a, 103-b and 103-c
103-a	CLIN 3-1	One Set of Payload System Flight Model		
103-b	CLIN 3-2	Twenty Sets of User Terminals		
103-c	CLIN 3-3	One Set of Feeder Terminal		
104	CLIN 4	Software & Documentation (on Application Programming Interfaces (APIs) and relevant documentation to enable operation and connectivity to the payload)		Sum of Item 104_a and 104_b
104-a	CLIN 4-1	Software & Documentation for EDU		
104-b	CLIN 4-2	Software & Documentation for FM		
105	CLIN 5	Training		1.Sum of Item 105_a and Item 105_b 2.Taiwan Income Tax (3%)

Item	CLIN	Description	Price	Remarks
				included
105-a	CLIN 5-1	Training for EDU		Taiwan Income Tax (3%) included
105-b	CLIN 5-2	Training for FM		Taiwan Income Tax (3%) included
106	CLIN 6	Support Services		1. Sum of Item 106_a, Item 106_b and 106_c 2. Taiwan Income Tax (3%) included
106-a	CLIN 6-1	Payload Integration Test Support Service		Taiwan Income Tax (3%) included
106-b	CLIN 6-2	Payload End-to-End Test Support Service		Taiwan Income Tax (3%) included
106-c	CLIN 6-3	Payload Support Service for the Satellite Mission Operation		Taiwan Income Tax (3%) included
110	Total	Total Contract Price		Sum of Item 101 ,Item 102, Item 103, Item 104, Item 105, and Item 106

* For local contractor, the total Contract Price shall include Taiwan 5% business tax but exclude Taiwan 3% Income Tax.

2. Tax calculation

2.1 Tax calculation of CLIN 5 and CLIN 6

Item	Description	Net Price (Contract Applicable Price minus Taiwan Taxes) 97%	Taiwan Income Tax (3%)	Contract Applicable price
105	CLIN 5 Training			Sum of Item 105_a and Item 105_b

105_a	CLIN 5-1 Training for EDU			
105_b	CLIN 5-2 Training for FM			
106	CLIN 6: Support Services			Sum of Item 106_a, Item 106_b and 106_c
106-a	CLIN 6-1: Payload Integration Test Support Service			
106-b	CLIN 6-2: Payload End-to-End Test Support Service			
106-c	CLIN 6-3: Payload Support Service for the Satellite Mission Operation			

Note:

The tax calculation formula is:

Net Price= Contract Applicable Price X 0.97

Taiwan Income Tax = Contract Applicable Price X 0.03

Contract Applicable price = Net Price+ Taiwan Income Tax

1.3 Tax calculation of Payments

Payment No	**Net Price (Contract Applicable Price minus Taiwan Taxes)**	**Taiwan Income Tax 3%**	**Contract Applicable price**

	97%		
1			10% of Item 110
2			10% of Item 110
3			20% of Item 110
4			30% of Item 110
5			10% of Item 110
6			10% of Item 110
7			10% of Item 110 Or 10% of Item 110 – 100% of Item 106-c (the contract price of CLIN6-3)

Note:

1. The tax calculation formula is:
   Net Price= Contract Applicable Price X 0.97
   Taiwan Income Tax = Contract Applicable Price X 0.03
   Contract Applicable price = Net Price+ Taiwan Income Tax

2. The application of the CLIN 6-3 service and its corresponding price payment is contingent on the result of the launch.

TASA 國家太空中心 Taiwan Space Agency

B5G-RPT-xxxx
Rev. 01
2024/07/23

B5G Software-Defined Radio Communications Payload Procurement Specification and Statement of Work (B5G 軟體定義射頻通訊酬載)

Taiwan Space Agency

國 家 太 空 中 心

Revision/Change Record
改版/變更記錄

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1 General Requirements

For the Beyond 5 Generation (B5G) mission, TASA is soliciting proposal on a Ka-band high-data throughput communication Payload for the low earth orbit communication satellite mission.

The work shall include the following:

1. Design, development, fabrication, assembly, integration, and test of the Ka-band high-data throughput communications Payload system in Contractor's facility, and communication Payload shall operate in 600 km of orbit for 3 years mission.
2. The high-data throughput communications Payload system includes the transmit and receive electronically steerable multibeam antenna and on-board data and control processing which shall be a comprehensive solution combining digital beam-former, RF SoCs, modem SoCs and phased array antennas etc.
3. Conduct the communications Payload subsystem functional test at Contractor's facility. TASA lead the satellite integration and testing and conduct the payload test. Contractor support the payload test in the satellite integration and testing at TASA facility.
4. Support the Payload connection and interface verification between feeder terminal (Gateway) and user terminal at TASA facility.
5. Support in commissioning of the Payload on-orbit test of B5G satellite with delivered user terminal and feeder terminal in Taiwan area.
6. Deliver the developed engineering design model (EDU) and according ground equipment to perform the same performance and function of the flight communication Payload system hardware and software during the ground test.
7. Deliver 20 user terminals and one feeder terminal with satellite network operation software to form a LEO communication system with the developed communication Payload.
8. Lead at least two (2) Taiwan companies assigned or audited by TASA to develop Taiwan user terminals and verify with the communication Payload at TASA facility and in orbit.

TASA B5G Concept of Operation

The communication Payload solicited in this document is part of one low-earth orbit (LEO) communication satellite, which in turn is part of a multi-generation communication system envisioned and being implemented by TASA.

TASA will

- Design, construct, and/or procure the hardware and software of Bus, OCT, User Terminals (UT), Feeder Terminal (FT)/Gateway, TT&C control center and stations, and network control center (SNOS),
- integrate the Payload into Bus,
- conduct satellite-level test including Payload test,
- conduct interface and functional tests with UT, FT, TTC, and SNOS,
- launch the satellite,
- conduct on-orbit test,
- operate the satellite including the Payload during 3 years lifetime.

Contractor shall support, as defined in the subsequent sections, TASA for the above activities.

TASA will provide the test facility and the basic test equipment at the satellite level, with specialized test equipment provided by Contractor as defined in the subsequent sections.

2 Communication Payload Flight Model Requirements

2.1 Functional / Performance Requirements

The high-data throughput communications Payload system shall be designed for simultaneous receiver and transmitter operation without mutual interference degrading the required functions and performance.

2.1.1 Transmitter Requirements

The transmitter shall be compliant with the following sets of requirements.

Transmitter	
- Operation Frequency	17.7-20.2 GHz
- Beams	Multi-Beam: ≧16 ; Beam hopping: ≧4
- Dwell time for beam-hopping	< 1ms
- Aggregate EIRP	≧50 dBW, Peak (45dBW at max scan angle)
- Beamwidth	2.5~4.6 degree (FWHM)

- Sidelobe	<-20dBc at boresight
- Polarization	LHCP or RHCP
- Cross polarization	≧25dB at boresight
- Scan Range	60 degrees
- Grating lobes	None for 60 degrees scan range
Required Rejection	Out of Band (except for harmonics) 40log10(F/1250 + 1) averaged per MHz where F is the frequency from the band edge in MHz (2.5 GHz b/w as per ITU R SM.1541-6 annex 2, section 2 on multiple carriers per transponder) Spurious Emissions outside of [14.7, 23.2] GHz 43.5 dBW in any 4 kHz.
Modulation	
- Waveform	DVB-S2X or any waveforms compatible with 3GPP LTE or 5G NTN systems
- Modulation / Coding	QPSK, 8PSK, 16APSK, 32APSK, 64APSK (Including but not limited) / LDPC, adaptive modulation and coding (AMC) schemes (Including but not limited)
- Throughput Data Rate	15Gbps for both feeder link and access link (≧300 User terminals with data rate 50Mbps)
- Multiple Access	≧16 Channel

Verification: Unit Design Review and Unit Level Test

2.1.2 Receiver Requirements

The receiver shall be compliant with the following sets of requirements.

Receiver	
- Operation Frequency	27.5-30 GHz
- Beams	Multi-Beam: ≧16 ; Beam hopping: ≧4
- Dwell time for beam-hopping	< 1ms
- Beamwidth	2.3~4.6 degree (FWHM)

- Sidelobe	<-20dBc at boresight
- Polarization	LHCP or RHCP
- Cross polarization	≧ 25dB at boresight
- G/T	≧ 4dB/K at boresight
- Scan Range	60 degrees
- Grating lobes	None for 60 degrees scan range
Modulation	
- Waveform	DVB-S2X or any waveforms compatible with 3GPP LTE or 5G NTN systems
- Modulation / Coding	QPSK, 8PSK, 16APSK, 32APSK, 64APSK (Including but not limited) / LDPC, adaptive modulation and coding (AMC) schemes (Including but not limited)
- Throughput Data Rate	15Gbps for both feeder link and access link (≧300 User terminals with data rate 50Mbps)
- Multiple Access	≧16 Channel

Verification: Unit Design Review and Unit Level Test

2.1.3 On-Board Processor Requirements

The on-board processor shall be compliant with the following sets of requirements.

- The OBP performs all functions (modulation/demodulation) using DVB-S2X or any waveforms compatible with LTE or 5G NTN systems.
- It should be able to configure the link bandwidth ratios between user terminal and feeder terminal. If no UT-UT traffic, the UT-FT traffic must be 1:1
- It performs packet switching and implements quality of service.
- It contains the Payload control software, which is responsible for orchestrating the operation of the Payload including the antenna, multi-beamforming, beam hopping, and regenerative processing.
- It provides an interface to control the Payload via both the platform and an in-band link.
- It shall be able to support both transparent (channelizer) and regenerative modes switching.
- It shall be able to support multiple access schemes with multiple user connections.
- It shall have the ability to connect to at least one (1) optical communication terminal.

In the proposal, Contractor shall describe the capability in programming, link bandwidth ratios configuration, channel, routing of OBP, the capability in user terminal interface such as acquisition of signal, hopping between users beams, handover from/to the next satellite, the capability in feeder terminal interface such as feeder terminal handover, and the capability in data routing to/from the OCT.

Verification: Review of Design and Test

2.2 Power Requirements

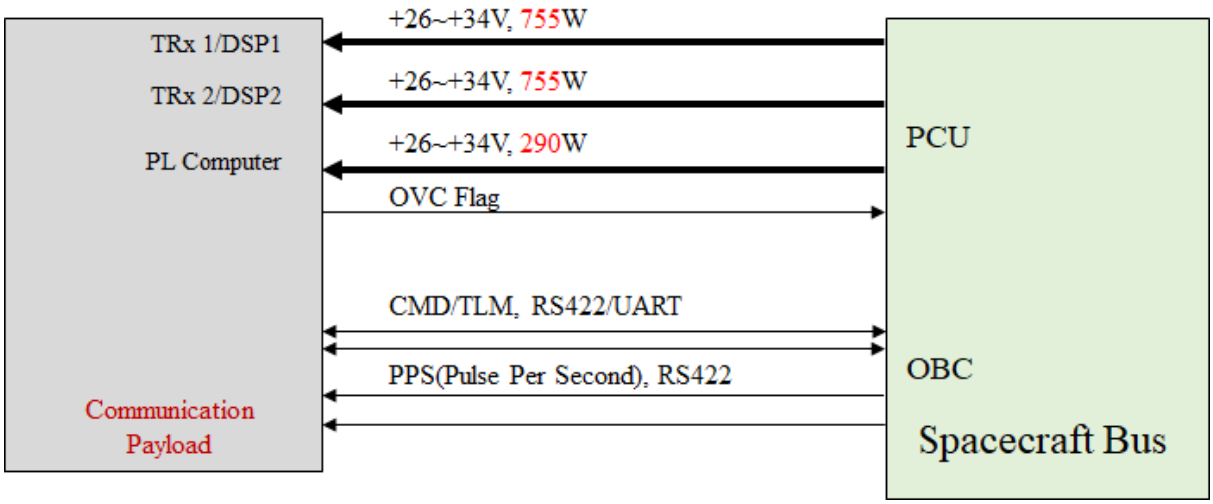
The communications Payload system shall accept +26V to +34V due to the internal DC-DC Converters and shall not exceed the following requirements

Power supply	+26V to +34V
Reset Input	Differential input voltage ≧3V (nominal 5V) and ≦0.5V for a duration of ≧10ms

Verification: Review of Design

2.3 Electrical Interface Requirements

The power and data input and output interface of high-data throughput communications Payload system shall be following



All the signal type in the CMD/TLM signal interface are including the RS422/UART and the bi-level pulse. The internal monitor analog signals and internal configuration mode control signals are used for housekeeping and telecommands respectively.

Verification: Review of Design

2.4 Interface Requirements between communication Payload system and User / Feeder Terminal

（1） Contractor shall provide the required information for Payload operation management in the Satellite Network Operation System (SNOS).

（2） Contractor shall provide the required information for user terminal/feeder terminal to Payload air interface design.

Verification: Review of Design

2.5 Interface to Optical Communications Terminal

On-board processor shall provide the command/telemetry interface, Ethernet physical layer media interface and the data link layer communication interface for the optical communication terminals design.

Data communication interface: Compliant with IEEE 802.3ae. 10GBASE-R or 10GBASE-W Serial 10G Ethernet Channel.

The interface needs to support at least one (1) optical communication terminal devices.

Verification: Review of Design

2.6 Physical Properties

- The total dimension should not exceed 1000 mm (X) x 850 mm (Y) x 200 mm (Z) above the Payload Interface Plane (PIP) and 500 mm (X) x 500 mm (Y) x 300 mm (Z) below the PIP. The specified tolerance is ± 0.125 mm.
- The material of the chassis shall be a suitable thickness Aluminum for radiation shielding requirement.
- Each delivered component should be supplied with the mounting bolt size and relative torque value in the MICD document.

Verification: Review of Design and Measurement

2.6.1 Connectors

The Payload subsystem components shall provide the connector labels that shall be used to reduce the possibility of incorrect mating exists.

Verification: Review of Design and Inspect

2.6.2 Mass

The mass of communication Payload system shall be less than 75kg including harness between Payload modules, and thermal hardware (if necessary) as required by Payload.

Verification: Mass measurement on the fully assembled unit.

2.6.3 Power consumption

Under all required conditions the maximum total unit dissipation shall not exceed 1800W(peak) during normal operation under all required conditions.

In the proposal, Contractor shall describe the max in-rush current at each module, the power consumption in various Payload modes (defined by Contractor) such as fully-loaded operation, partially-loaded scenarios, set-up, stand-by, safe, and off, and in several orbit positions relative to the Sun.

Verification: Review of Design and Unit level Test (Measurement of input current and voltage)

2.7 Thermal Design Requirements

Contractor shall provide the operation temperature (Tmax/Tmin) information of the communication Payload unit and cooperate with TASA thermal engineer of satellite bus to discuss the thermal control interface. Then thermal design and analysis of communication Payloads should be provided.

Verification: Unit design report

2.8 Environmental Requirement

This section presents the applicable TASA specific environmental specifications.

Components provided from external suppliers will be validated and verified at unit level unless otherwise agreed with TASA. Validation and acceptance will be carried out according to component level development plan.

Components shall be designed or protected against any deterioration leading to failure to meet the requirements specified herein caused by climatic and environmental conditions during its entire operating and non-operating lifetime.

Contractor shall provide the qualification test report of payload in engineer qualified model and acceptance test report of payload in flight model

2.8.1 Dynamic Environments

Unless specified otherwise in the relevant dedicated unit or component specification, the Components shall have a first natural frequency higher than 150Hz. If the first mode is below this value it should be discussed further with TASA to assess the risk and implications.

2.8.2 Random Vibration

The qualification / protoflight and acceptance test levels for random vibration tests are specified in Tables 3.1-2 and 3.1-3.

Table 3.1-2 Random Vibration Test Levels for Component more than 2 kg

Frequency Range in Hz	Qualification / Protoflight		Acceptance	
	Out of plane	In Plane	Out of plane	In Plane
20 – 100	+ 3 dB/oct	+ 3 dB/oct	+ 3 dB/oct	+ 3 dB/oct
100 - 600	0.2 g2/Hz	0.1 g2/Hz	0.1 g2/Hz	0.05 g2/Hz
600-2000	- 6 dB/oct	- 6 dB/oct	- 6 dB/oct	- 6 dB/oct
Test Duration	2 min / 1 min	2 min / 1 min	1 min	1 min
Rms in g	13.92	9.84	9.84	6.92

Design Level = Qualification Level= Protoflight Level=Acceptance Level+3dB

Qualification test duration : 2 min/Axis

Protoflight test duration = Acceptance test duration : 1 min/Axis

Verification: Unit Level Test

2.8.3 Sine Vibration

The sine vibration environment is given in Table 3.1-5. Unless specified otherwise in the relevant appendix to this document or in the relevant dedicated unit or component specification, the following sine environment shall apply. These sine vibration levels shall apply between 5 and 100Hz. At low frequency it is understood that tested acceleration levels will be limited by the shaker capability.

Table 3.1-5 Sine Vibration Test Levels and Durations (all axes)

Hz	Qualification (Design Level)	Acceptance (Flight Level)
5-X	Max shaker capability	Max shaker capability
X-100	26.25g	21g
Test Duration	1 sweep up with 2 oct/min	1 sweep up with 4 oct/min

Table 3.1-5 Sine Vibration Test Level and Duration

Hz	Qualification (EQM)	Protoflight (PFM)	Acceptance (FM)
Level	×1.25	×1.25	×1
Test Duration	1 sweep up with 2 oct/min	1 sweep up with 4 oct/min	1 sweep up with 4 oct/min

Verification: Unit Level Test

2.8.4 Shock

The component shall withstand the shock levels specified in Figure 1.

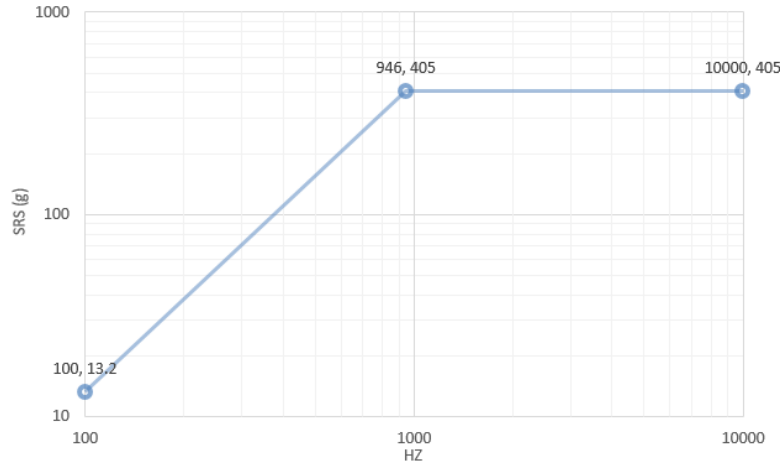


Figure 1 **Shock Prediction Level in each zone**

Qualification Level= Acceptance Level+ 3dB

Shock Test: two sets of test (one set of test includes + and – direction individually) per axis for qualification and one set of test (one set of test includes + and – direction individually) per axis for acceptance.

Verification: Review Unit Level Test Data (QM or EQM)

2.8.5 Component Mounting

All mounting points and the contact area shall be in a common plane within 0.2 mm. Each contact area shall have a roughness of less than 3.2 microns.

Verification: Review ICD

2.9 Thermal Environments

2.9.1 Temperature Range

The component operating and non-operating temperature range shall be compliant with individual component specification.

2.9.2 Temperature Extremes

All Payloads and spacecraft components shall be designed to have 10 °C design margin. For these components, the acceptance and protoflight test limits and their relationship to the required thermal margins are shown in Figure 3.2-1.

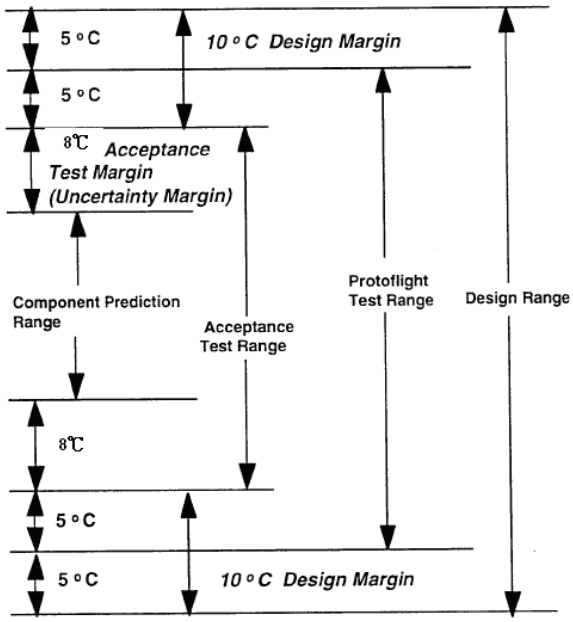


Figure 3.2-1 Component Thermal Design

2.9.3 Thermal Cycling / Thermal Vacuum Tests

All of the components shall perform the thermal cycle test or thermal vacuum test to demonstrate the capability. For non-vacuum sensitive components, e.g. passive RF components including antenna, switch, diplexer, power divider and filter, the requirements may be satisfied by temperature cycling at normal room pressure in an air or gaseous-nitrogen environment. Parameters to be monitored shall include chamber gas and component base plate temperatures. All component temperatures shall be monitored and controlled using calibrated test equipment. A summary of thermal vacuum test and thermal cycling test requirements are shown in Table 3.2-1. The FM acceptance test allow the vendor selects option (i) or option (ii) to conduct in Table 3.2-1.

Table 3.2-1 Thermal Test Requirements Summary

Test Level	Qualification (EQM)	Acceptance (FM)
Temperature	Tmax/Tmin(Op/Nop) ± 10 ℃	(i) Tmax/Tmin(Op/Nop) ± 10 ℃ (ii) Tmax/Tmin(Op/Nop)
Pressure, mbar	≦ 5 x 10^{-5}/ Ambient	≦ 5 x 10^{-5}/ Ambient
Number of cycles	≧ 8*	(i) ≧ 4 (ii) ≧ 8

Dwell at high and low	≧ 2 hours	≧ 2 hours

* : 8 required thermal vacuum cycles may be replaced by 8 thermal cycles for non-vacuum sensitive components.

Verification: Review Unit Level Test Data

2.10 Electromagnetic Compatibility (EMC)

The component level conducted and radiated EMC specifications are defined in the following sections. The test methods shall follow those of MIL-STD-461F.

2.10.1 Conducted EMC (CE & CS)

CE on Primary Power Lines (CE 102): The conducted emissions on power leads, including returns, shall not exceed the limit line shown in Figure 3.3-1.

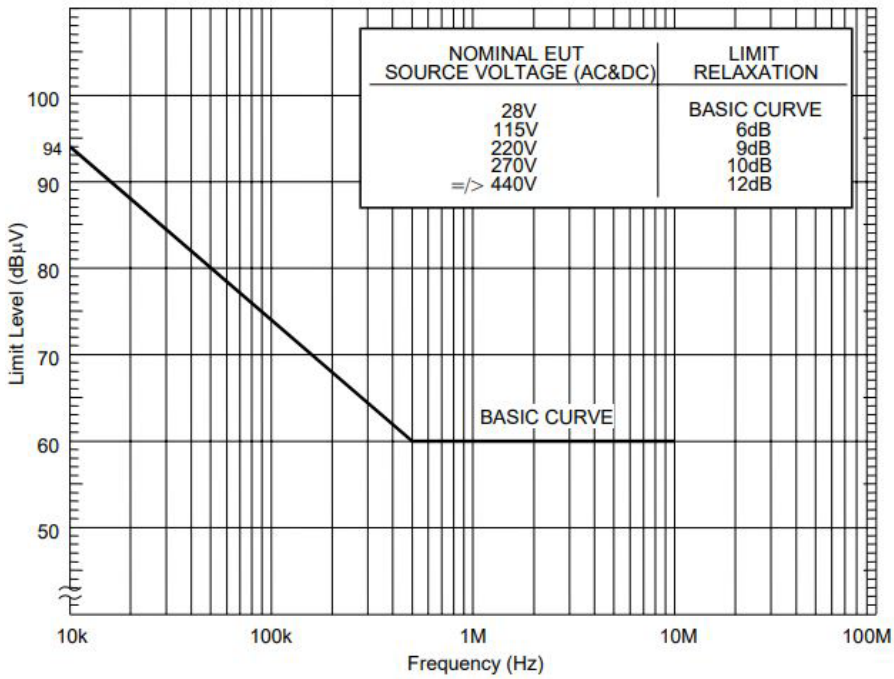


Figure 3.3-1 CE102, CE on primary power lines (EUT power leads, AC and DC)

CE on Transmitted Unit (CE 106): The conducted emissions is applies to the antenna ports of transmitters, receivers, and amplifiers over the frequency range of 10 kHz to 40 GHz. The requirement does not apply to equipment designed with antennas permanently mounted to the EUT. The transmit mode portion of MIL-STD-461G CE106 is not applicable within the bandwidth of the EUT transmitted signal or within ±5 percent of the fundamental frequency,

whichever is larger. Conducted emissions at the EUT antenna port shall not exceed the values given below.

A. Receivers: 34 dBμV

B. Transmitters and amplifiers (standby mode): 34 dBμV.

C. Transmitters and amplifiers (transmit mode): Harmonics, except the second and third, and all other spurious emissions shall be at least 80 dB down from the level at the fundamental. The second and third harmonics shall be suppressed to a level of -20 dBm or 80 dB below the fundamental, whichever requires less suppression.

CS on Power Leads (Sine Wave Injection)(CS 101-1): The equipment shall demonstrate proper functioning when a sine wave with amplitude as indicated in Figure 3.3-2 is added onto the primary power lines.

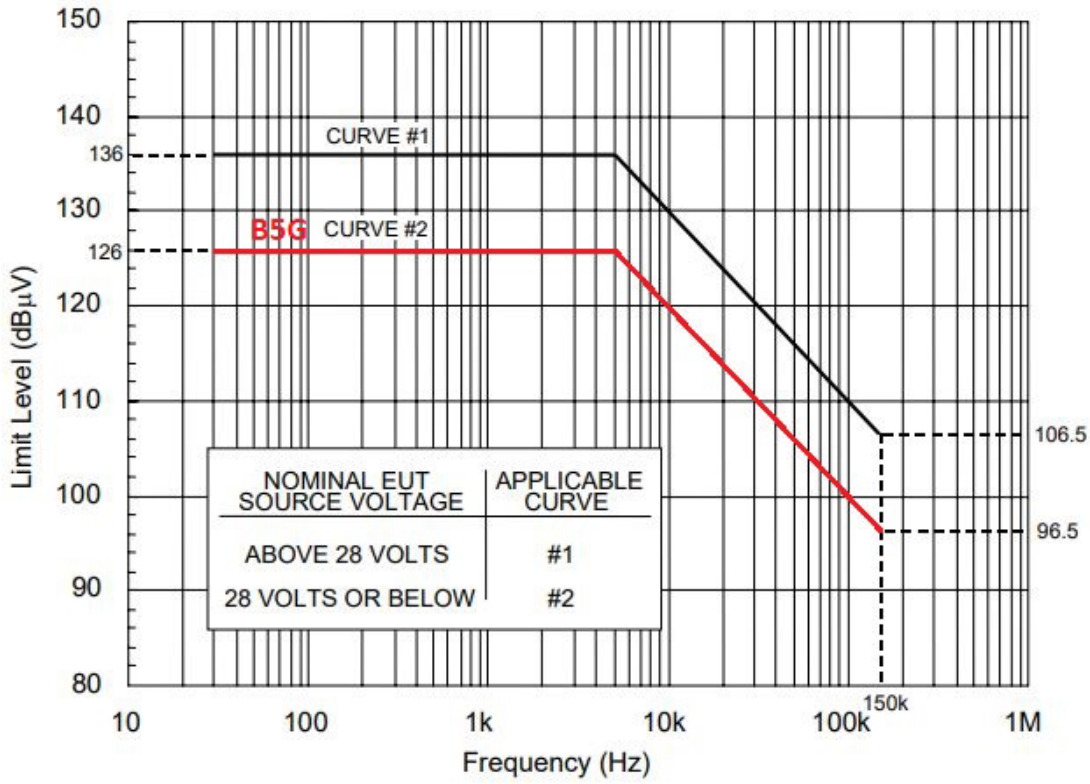


Figure 3.3-2 CS101-1, Power Leads, 30 Hz to 150 KHz

CS on Bulk Cable (Pulse Modulation Injection)(CS 114): The equipment shall demonstrate proper functioning when pulse modulation signals with current limit as indicated in Figure 3.3-3 CURVE #3 are added onto the primary power lines.

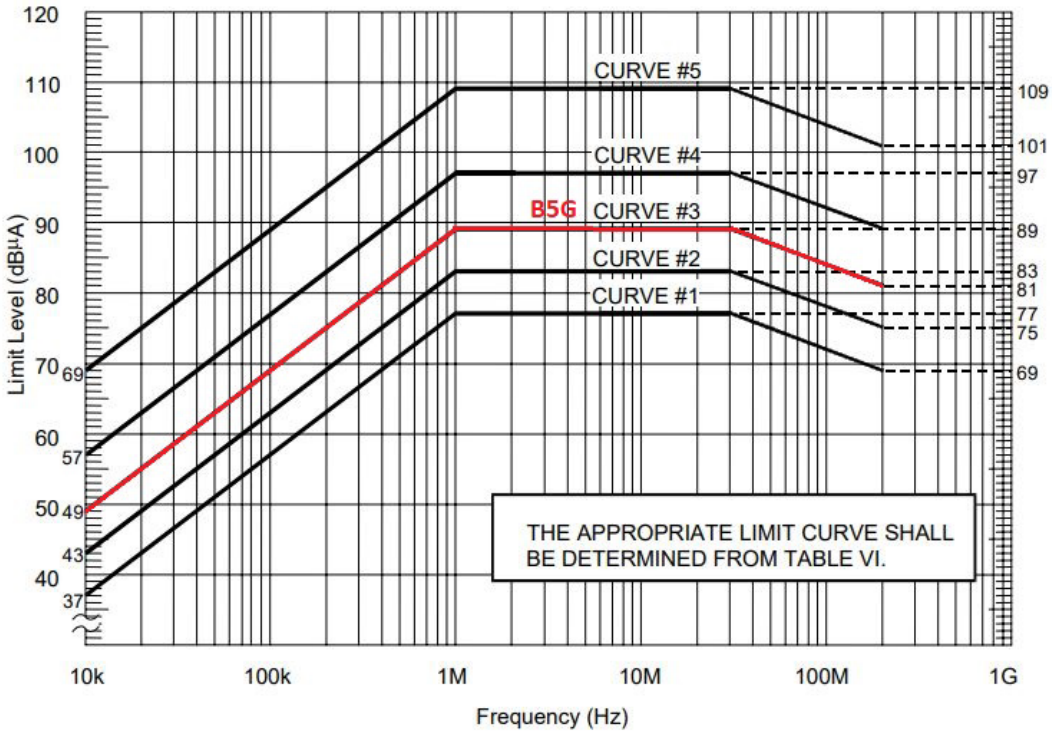


Figure 3.3-3 CS114, Pulse Modulation Injection, 10KHz to 200 MHz

Verification: Review Unit Level Test Data (QM or EQM)

2.10.2 Radiated EMC (RE & RS)

2.10.2.1 Radiated Emission (RE)

Figure 3.3-4 show the radiated emission shall not exceed the limits indicated by “B5G-EP limit”.

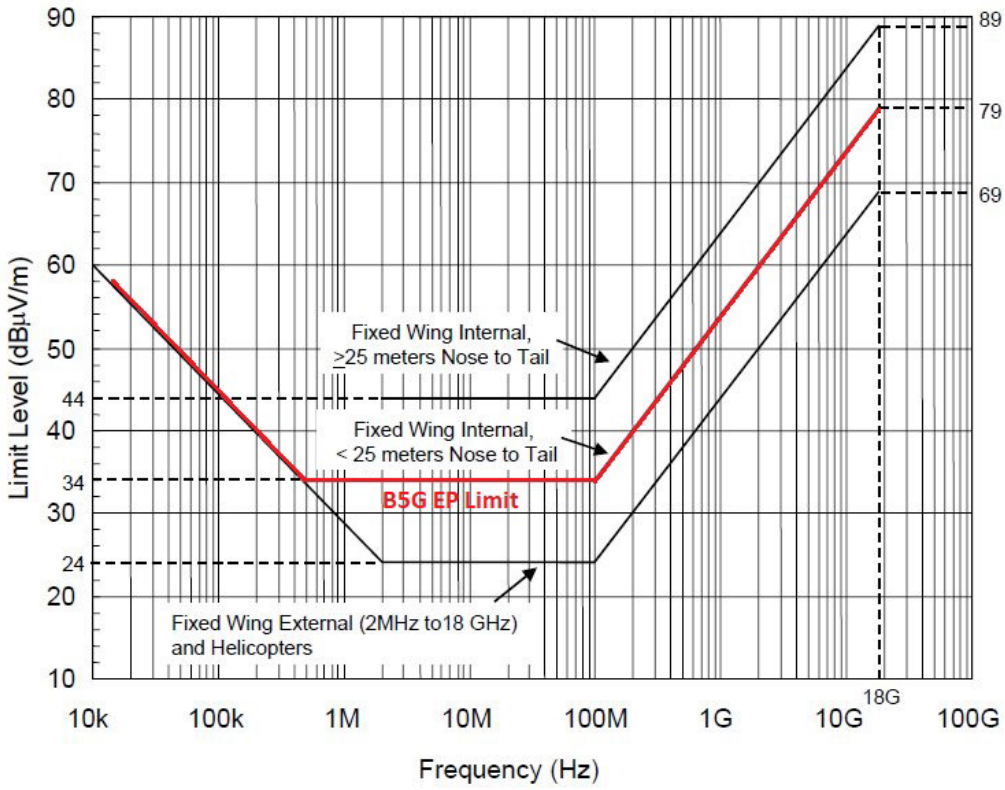


Figure 3.3-4 RE102, RE Limits (10KHz ~ 18GHz)

In addition, the radiated emission measured in the following frequency ranges shall not exceed levels specified as follows:

(1) GPS receiver [1560MHz～1590MHz]: 20 dBµV/m

(2) S-band receiver [2039MHz-2041MHz]: 10 dBµV/m

(3) Ka-band: 27GHz ~ 30GHz: 15 dBuV/m

(4) L-band: 1525MHz ~ 1559MHz: 10 dBuV/m

MIL-STD-461G RE103 may be used as an alternative for CE106 when testing transmitters with their intended antennas. Harmonics, except the second and third, and all other spurious emissions shall be at least 80 dB down from the level at the fundamental. The second and third harmonics shall be suppressed to a level of -20 dBm or 80 dB below the fundamental, whichever requires less suppression. The limit curve is shown below in Figure 3.3-5.

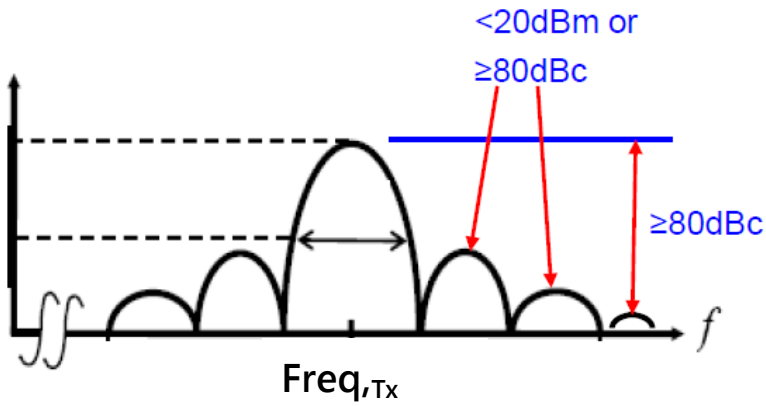


Figure 3.3-5 RE103 Limits

Ku: 17.8~19.3 GHz

Verification: Review Unit Level Test Data (QM or EQM)

2.10.2.2 Radiated Susceptibility (RS)

The unit shall not exhibit any malfunction, degradation of performance, or deviation from specified indications when subjected to the E-field radiation with the levels specified in Figure 3.3-6 and modulated as specified in MIL-STD-461G RS103.

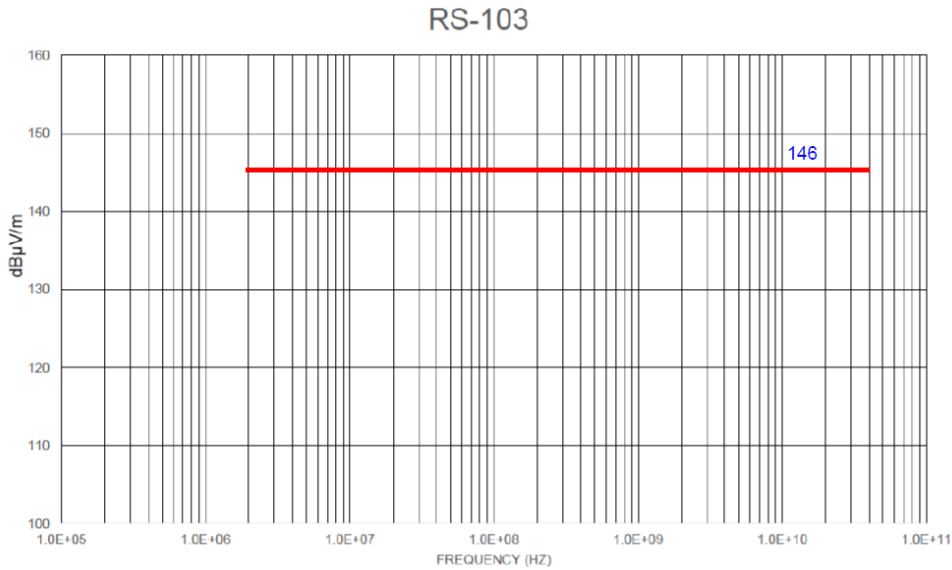


Figure 3.3-6 RS103, RS Electric Fields Level (2MHz to 40GHz)

In addition, the unit shall not exhibit any malfunction, degradation of performance, or deviation from specified indications when subjected to the E-field radiation with the specified level in 20 V/m (146 dBuV/m) over the frequency range of 2 MHz to 40 GHz.

Verification: Review Unit Level Test Data (QM or EQM)

2.10.3 EMC Test

Electrical components shall undergo EMC testing or analysis as required. Testing shall be performed for the test parameters and components considered to have the greatest impact on achieving system level compatibility (both system self-compatibility and compatibility with specified external environments). Specific types of testing required for each component shall be specified in the appropriate equipment specification. The test shall verify that:

1) The hardware will operate properly if subjected to conducted or radiated emissions from other sources that occur or could occur during integration and test, launch, or in orbit (susceptibility tests);
2) The hardware does not generate either conducted or radiated signals that could hinder the operation of internal subsystems or other systems (emission tests).

If developmental hardware is judged to be representative of flight hardware from an EMC test viewpoint, EMC testing may be performed on engineering models.

The final pass/fail criteria for component level EMC tests shall be the resultant effect on the EMC performance of the integrated spacecraft. Component test over-limit performance shall be analyzed to determine the resultant system level performance. If the analyses indicate acceptable system level performance, the unit design shall be considered acceptable for use.

2.11 Bonding, Grounding, and Isolation

2.11.1 Bonding

1. Metallic shells/receptacles of connectors shall be electrically bonded to the equipment case or to the bracket structure with a DC resistance of 20 mΩ or less.
2. A DC resistance of less than 20 mΩ shall be maintained between the bonding stud and the spacecraft structure or the Payload ground network.
3. The unit delivered with a bonding stud shall have a DC resistance < 10 mΩ from the unit chassis to the bonding stud. The bonding stud can be a M4 bolt, feasible minimum length is 10mm. Small items may provide a grounding insert instead of a bonding stud.

Verification: Unit Level Test

2.11.2 Grounding

The grounding scheme of the B5G-EP Satellite represents a distributed star-point grounding (DSPG) as outlined in Figure 1-10.

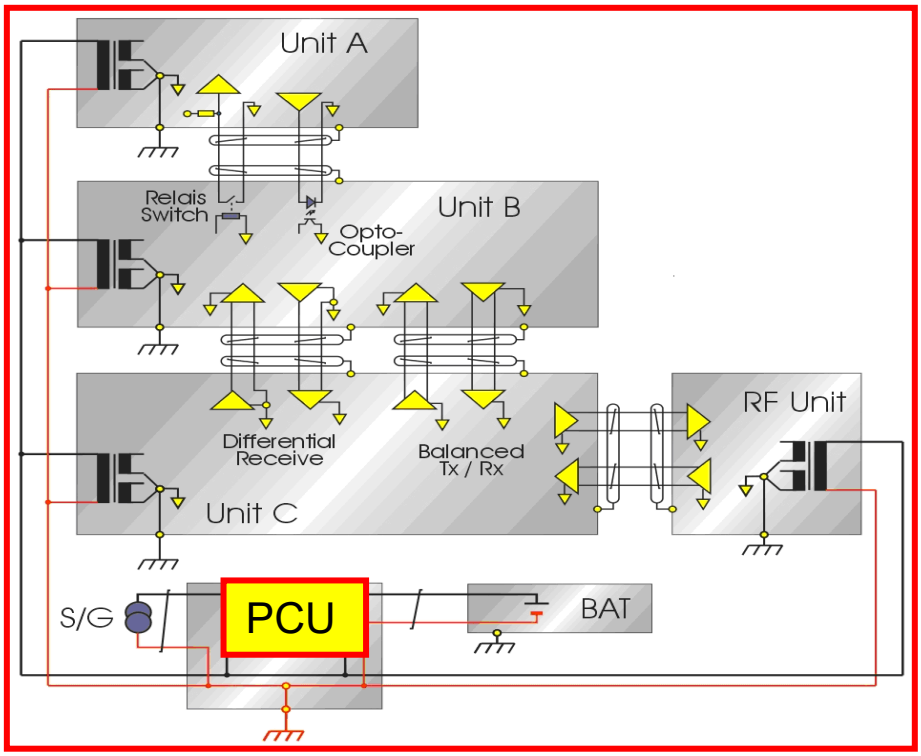


Figure 2-1 **Grounding Concept**

1. All primary power supplies are referenced to a single point located in PCU.
2. Primary power supplies are galvanically insulated from the secondary ones.
3. All secondary supplies are referenced to the unit housing.
4. All unit housings are locally referenced to the structure at a single point.
5. All return currents flow through the dedicated return wires.
6. No current shall flow through the spacecraft structure.
7. The grounding resistance between the secondary ground and the unit chassis should be ≦ 20 mΩ.

Verification: Unit Level Test

2.11.3 Isolation

1. The resistance between the primary power (+/-) and the chassis shall be ≧ 1MΩ.
2. The resistance between the secondary power (+) and the chassis shall be ≧ 1kΩ.

Verification: Unit Level Test

2.12 Inrush Current

The switch-on current shall return to nominal current level within 5ms.

Verification: Unit Level Test

2.13 Radiation Environment

2.13.1 Total Dose and Non-Ionizing Energy Loss

The component shall be designed to withstand a radiation total dose and a non-ionizing damage dose for 600 km and 3 years mission duration with at least 100% margin. For calculation of the component total dose level the actual component housing thickness and effective shielding of the satellite structure shall be considered. The required total dose radiation tolerance of the parts must be least 30Krad when the aluminum shell design of the chassis meets at least 2.5mm thickness. If not then relevant analysis and justification is to be provided.

2.13.2 Single Event Effects (SEE)

Components shall be designed to ensure that nominal performance is maintained in the presence of SEE. This can be done by circuit design at module level (EDAC, latch protection circuitry, filtering etc). If required, SEE rates can be calculated using SPENVIS software (this software also generates the GCR and SEP LET environments for the mission required for SEE rate analysis).

Verification: Review of Design, Analysis, or Available heritage information will be provided.

2.14 Transportation, Handling and Storage

During handling and transportation, the components shall be protected from the induced environment to levels below those of its launch environment.

All handling, assembly, integration, testing and transportation preparation shall be performed in a clean environment and maintain visual clean.

3 Product Assurance Requirements

The Contractor Product Assurance (PA) approach shall ensure an effective an economic procurement program including design, development, manufacturing, assembly, test and delivery of the equipment specified in this document.

PA activities shall be performed in accordance with the following rules:

- Contractor shall nominate a team engineer as focal point of contact related to product assurance issues.
- Each unit engineer shall be responsible for the execution of the PA tasks as defined in this chapter in his engineering / AIV work package (total quality management).
- All deliverable documents and all additional PA relevant documentation on unit level shall be signed by at least one members of the component engineering team and by the designated PA focal point engineer.
- Existing PA management policies, forms, processes and procedures may be utilized.
- The PA tasks shall be performed on all qualification, flight models and for the GSE, as relevant
- The requirements shall be applicable to all involved sub-Contractors.
- The requirements shall be applicable for all hardware and software items and for all services provided under this contract

TASA PA shall support the procurement process and has the right to attend the project meetings.

All Major NCRs, deviation/waiver, engineering changes will be given to TASA for approval.

3.1 Personnel Safety

Personnel safety shall be the responsibility of Contractor. Safety hazards shall be identified in all relevant test and integration procedures referring to specific safety assurance procedures where necessary. The main goal is to prevent personal injury and to prevent damage of flight equipment and facilities.

The Contractor shall use his own safety policy and procedures considering local, state and national safety requirements.

The procedures shall clearly identify hazard and also include preventive measures, required infrastructure or environment etc. controlling or eliminating these hazards.

The applicable range safety requirements shall be met.

3.2 Reliability

Qualitative reliability shall be assured by design and proven by analysis and testing as specified hereafter. Reliability of electronic and electromechanical components shall be proven by a two-fold approach consisting of reviews of circuit design for reliability and operating time requirements.

The Contractor will provide empirical, tested, or analysis reliability value for its product. Some reliability related data, e.g. mean time between failure or failure rate, can be provided for reference if they exist.

3.2.1 Design for Fault Tolerance

The analysis of the performance shall be verified after the loss of one entire string which is commonly accepted as the worst case failure. The following failures are considered non-credible:

- Fracture of Harness
- Self-demating of connector

3.2.2 Support to System Level FMECA

The Contractor shall support the system level FMECA by providing a related functional description of the equipment and a detailed design description of its electrical interfaces.

3.2.3 Operating Time

Each electronic and electrical component shall accumulate a minimum of 300 hours operating time (including acceptance testing) prior to delivery. This may include operating time at the assembly level. Internally redundant units must accumulate at least 100 hours on each redundant side. If accumulated operating time is less than 300 hours at the completion of acceptance testing, then additional operating time shall be accumulated alter the completion of this testing such that the requirement is met. In this case, after the additional hours, a performance test shall be performed prior to delivery. TASA side continues to accumulate operating time.

Contractor shall record the entire telemetry for the entire test program at the Payload level, and provide the recorded data, with description of the data format, to TASA as part of FM delivery.

3.3 Electronic Parts Reliability

3.3.1 Parts Selection and Quality

Particle Impact Noise Detection (PIND) test will be done as considered necessary by the Contractor. Heritage information will be delivered if available. Please provide the parts list or test reports for TASA review. For example, flight heritage.

Destructive Physical Analysis (DPA) is not requested unless considered necessary by the Contractor.

Where possible, preference shall be given to using heritage standard parts.

A decision whether additional testing has to be performed shall be decided by TASA. This additional testing may include e.g. Precap Inspection or DPA on three samples or adequate burn-in test.

3.3.2 Parts Lists

The Contractor shall deliver or at least give insight the as-designed and as-built EEE COTS parts list for the unit. This parts list will be approved by TASA.

The component parts list shall be established and maintained by the Contractor including (as a guideline):

1) Part name / type
2) Part manufacturer
3) Description
4) Package
5) Date code
6) Quantity per board/equipment
7) Procurement specification (include. issue/revision)
8) Quality level
9) Reference to qualification/heritage (ESA/SCC, MIL, other successful program)
10) Up-screening requirements
11) Comments

The components parts list according to Contractor documentation standard containing above mentioned typical information will also be acceptable. Please provide the parts list or test reports for TASA review. For example, flight heritage.

3.3.3 Derating

Derating Requirements and Application Rules for Electronic Components shall be followed in the design of the Payload.

3.3.4 Parts Age Limitation

No EEE COTS parts older than seven (7) years, as indicated by their lot date code shall be used without additional retesting. Use of parts older than 7 years shall have approval of TASA and the following inspections and tests shall be performed as applicable:

- External visual inspection
- 100% Electrical measurement of critical parameters
- Solderability test
- Fine and Gross leak test per applicable specification

3.4 Materials and Processes Control

Material Selection: Early notification of new or unproven materials together with proposed testing and analysis shall be provided for approval to TASA. Please provide the parts list or test reports for TASA review.

The following information to materials shall be provided:

- Applicable drawing ID / usage
- Type of material
- Identification of life limited items
- Identification of flight heritage or reference to standard parts list
- Main dimension

Structure items and surfaces shall be protected against any deterioration caused by climatic and environmental conditions experienced during its ground and orbit life time. Adequate protection against corrosion, moisture and electrolytic corrosion shall be foreseen by suitable material and/or coating selection.

Copper alloys containing zinc must be plated to prevent sublimation or vaporization. Aluminium, magnesium and ferrous alloys susceptible to stress corrosion cracking shall not be used for critical items.

Life Limited items: Life limited materials shall be avoided wherever possible. Potential limited life items that are planned for use in flight hardware shall be identified in the material list (including maintenance / replacement requirements).

Coupon Testing: Coupon samples for all multi-layer Printed Wiring Boards (PWBs) shall be evaluated by certified inspection personnel prior to board population. The inspection shall be in accordance with the PWB quality level.

Certification and Traceability: Materials and semi-finished products shall have been inspected by the manufacturer/ Contractor to ensure compliance to requirements (e.g. chemical composition and basic strength testing for structural/ mechanical materials). Certification of compliance according to DIN 50049-2.2B or 3.1B or equivalent shall be provided by the manufacturer.

In frame of the EIDP the Contractor shall certify full compliance between the as-designed and the as-built status.

3.5 Critical Items

Critical items (CI) shall be identified in accordance with the definitions as given below:

- Safety critical items
- Life limited items
- Long lead items with lead time of more than 15 months
- Items not previously space qualified
- Items whose failing may significantly affect the mission success (single point failures)
- Items with high process sensitivity
- Items requiring export license (e.g. U.S. ITAR, ECCN)

CI's shall be controlled via a critical items list which shall be supplied to TASA during CDR and at final equipment delivery

3.6 Hardware Quality Assurance

The Contractor shall use their existing QA programs and practices. No formal documentation is required, TASA may, however, perform inspections / audits to ensure that appropriate space standards in the unit design, fabrication, assembly and test are applied. The Contractor shall allow TASA personnel to witness these inspections and audits, as well. Contractors need to consult with TASA for review feedback discussion before making partial adjustments.

The following points shall be considered:

- Personnel training and certification
- Application of space qualified processes and procedures
- Procedures for handling, shipping, storage of hardware
- Inspection processes (incoming, workmanship, safety, etc.)

- Calibration of support and test equipment
- Control of test facilities to protect the test article from damage or degradation due to handling, storage, environmental conditions etc.
- Protection / control of Electrostatic Discharge (ESD) sensitive parts, assemblies and equipment
- Workmanship and process control against written procedures and plans
- Interface and configuration control
- Quality certification
- Safety procedures
- Manufacturing documentation

Records that provide evidence of inspections, tests, configuration and material review actions during the fabrication and assembly process shall be maintained.

Connector mating/de-mating cycles shall be reduced to a minimum and connector saver shall be used, where possible.

Cleanliness: After unit assembly, all flight hardware shall be handled in a Class 100,000 environment or at least shall be cleaned before delivery. Class 100,000 conditions is considered sufficient unless Contractor request higher requirement to guarantee the performance.

Workmanship: All parts shall be manufactured and finished in a thorough manner with established industry standards. Particular attention shall be paid to neatness and precision of working parts and assemblies. All parts shall be free of burrs, sharp edges and other imperfections that might affect assembly or cause the start of malfunction or cause injury to personnel.

For the design, manufacturing and assembly of the printed circuit boards the following standards shall be maintained:

- Layout: IPC-2221 and IPC 2222
- Manufacturing: IPC-6012 Class 3/A
- Assembly: ANSI/J-STD-001, Class 3

Procedures: For hardware fabrication and assembly written procedures shall be used. In the procedure specific assembly instructions, inspection operations and tests, including criteria and techniques shall be defined.

Inspection Points (MIP's/KIP's): The customer reserves the right to witness major manufacturing and integration steps. The presence of TASA staff shall be allowed. Or provide the parts list or test reports for TASA review.

3.7 Software Quality Assurance

N/A

3.8 Configuration Management

Unit configuration control shall be performed by TASA and Contractors as follows:

Unit Component Specification:

TASA: Preparation of unit specification, review, approval and configuration control

Contractor: Provide inputs and approve via contract changes to be submitted via proposed specification updates / deviations to be tracked via Requests for Waivers (RFWs) or document updates

Configuration control starts at unit contract signature

3.9 Unit Manufacturing and Verification Documentation:

Contractor: Preparation of documentation, configuration control (tracking of changes via NCRs, ECR or document updates) until unit final acceptance.

Configuration control starts with manufacturing release

3.10 Unit EIDP plus related hardware and software

TASA: Review and approval

Contractor: Preparation of EIDP, configuration control (tracking of changes and update of related documents resulting from NCRs at system level test) until unit final acceptance

Remark: The final as designed and as built status of a unit including NCRs and ECRs shall be provided in the EIDP

Configuration control starts at consent to ship.

3.11 Ground Support Equipment Product Assurance

N/A

3.12 Non-Conformance Reporting

Non-conformances or problem / failures shall be reported by the Contractor. The Contractor may utilize his standard failure and anomaly reporting processes. To streamline non-conformance reporting (NCR) for the B5G project, an NCR log shall be kept to document all NCRs as follows:

- Issue date
- NCR title / description
- NCR classification (major or minor)
- Close out status / date

The NCR classification shall be performed as follows:

Major NCRs: Problems / failure which are impacting the function, performance, interfaces, reliability or schedule as specified in this document or exhibit a potential personnel or hardware safety concern. Furthermore problems / failures / changes which are affecting the qualification / acceptance procedures.

All Major NCRs will be given to TASA and require TASA approval, signature for final disposition and closure.

Minor NCRs: Minor NCRs are not directly impacting the schedule or deviating from specified performance. These NCRs typically include human errors in the manufacturing or verification process, or minor interface inconsistencies.

The Contractor shall inform TASA about major NCRs within 48 hours and about minor NCRs within two calendar weeks. The TASA assumes the right to adapt the rating in accordance to his evaluation.

Anyone witnessing an anomaly has the responsibility and authority to report a problem and generate a NCR. Requirements for reporting problems/failures start as follows and last until final unit acceptance:

- Electronics: Starting with unit / assembly / box level first power-on
- Mechanical devices: Starting with unit / assembly level first functional test
- Flight software: Starting with first use with flight hardware

Failure analyses including electrical, thermal and/or mechanical stress analyses, if needed, shall be conducted to adequately determine and characterize the failure, as well as to under-stand the cause of the problem and possible implications on all elements of the unit.

If necessary for failure analysis, a DPA of the failed parts shall be performed at Contractor facility. On request failed parts and related NCRs shall be delivered to TASA on request.

All NCRs shall be compiled in the unit EIDP.

3.13 Request for Waiver

The Contractor shall prepare a Request for Waiver (RFW) in case of deviations from this specification. The waiver shall include all necessary technical information, justification and risk statement. RFWs shall be established also for deviations in areas of EEE-parts, PMPs, de-rating analyses and deviations reported via NCRs.

The RFW shall be approved / disapproved by TASA.

3.14 Consent to Ship

The customer will provide consent to ship (for system integration) based upon:

- Availability of deliverable hardware
- Successful unit level test performance
- Availability and successful review of deliverable documents / EIDP
- No major open work resulting from NCRs

The EIDP shall arrive at TASA site for review at least 14 days before scheduled shipment.

In order to derive a consent to ship TASA reserves the right to perform the necessary review of EIDP and associated hardware in the context of a Pre-Ship Review at the Contractor's site which may also include a post-test hardware inspection. TASA shall be invited.

3.15 Handling, Packaging and Transportation

The equipment shall be properly packed according to the company standards and heritage to guarantee proper and safe transport (e.g. airfreight) to the customer. A written procedure shall be prepared and implemented by Contractor for preservation, packaging, handling, transportation, and storage of flight equipment subject to damage or deterioration or requiring safety precautions throughout the entire handling, shipping, transportation, and storage activities. Equivalent standard practices should be followed. The Contractor 's procedure shall be reviewed by TASA prior to shipment of equipment.

The following topics shall be considered and applied if as guideline:

- For ESD sensitive equipment ESD suitable packing materials shall be used
- Connectors shall be protected by dust caps resp. connector savers
- Equipment shall be double bagged with drying agent and humidity sensor to guarantee dry conditions below 50% humidity.
- Shock sensors indicators in three axis shall be mounted either directly to the equipment (preferred, e.g. on fixation plate) or at least mounted to each inner transport container / item to monitor shock levels exceeding during transport handling. The shock sensor sensitivity

when applied to the equipment shall be selected in accordance to equipment sensitivity as guideline. Details to be frozen at PSR meeting before shipment.

Equipment	Classification	Typical Max. Acceleration (g)
PL	Electro-Mechanical Equipment, Instrumentation	60-80 Shock sensor

- The PL shall be packed in double bagging and protecting bubble foil / damping material. The standard and experienced vendor practice shall be implemented.
- The PL will be placed with adequate shock absorbing / damping materials in a wooden transport box suitable for fork lift / pallet handling.
- The transport box shall be labelled with necessary handling, pre-caution / warning and transportation information / labels.
- The transport package shall contain minimum documentation like delivery note / packing list, log sheets and transport / handling procedure or other agreed documentation.
- Further equipment related packing / transportation will be defined and agreed at CDR/PSR.

3.16 Acceptance

A **preliminary acceptance** will be provided by the customer within 14 days after EIDP delivery based on:

- Complete delivery and acceptance of all documents including EIDP
- Consent to ship

Final acceptance will be provided by TASA based upon:

- Successful incoming inspection at TASA site
- Complete delivery and acceptance of all documents

Note: In case of a failure during the system test at TASA, the communication Payload (PL) shall be refurbished by the Contractor under warranty. The test procedure are opened to Contractor and the test results are shared with Contractor. Repair/refurbishment is performed to the issues under Contractor's workmanship problem and responsibility.

4 Ground Test Equipment Requirements

The Contractor shall provide the ground test equipment corresponding to the communication Payload specification and ICDs, and demonstrate the satellite to ground connection tests at TASA facility. The ground test equipment shall be used for simultaneously and individually testing 16 user terminal links and 1 feeder terminal link.

The ground test equipment shall include modem, RF, controller, and test software and procedures (CLIN 2-1) to implement user terminal functions for Payload access link, including both baseband hardwire and RF wireless connections. The baseband hardwire connection is a test-only connection.

The ground test equipment shall also include modem, RF, controller, and test software and procedures to implement feeder link functions for Payload feeder link (CLIN 2-2), including both baseband hardwire and RF wireless connections. The baseband hardwire connection is a test-only connection.

The test equipment shall also provide the capability of testing the internal working of the Payload. The test equipment shall assist collection of evidence for trouble shooting the Payload and the interface with UT/ feeder terminal /SNOS/OCT (CLIN 2-3). In the proposal, Contractor shall describe the proposed depth of these capabilities.

In the Proposal, Contractor shall list and describe its proposed specifications of the test equipment, and the test verification method of the test equipment by itself and when coupled with the Payload. The test verification method will be further developed into the Test Plan for Test Equipment (see PDR and CDR).

Although CLIN 2-1, 2-2, and 2-3 have separate quantities, a single physical controller and/or other combination of functions (as mutually agreed) is acceptable. Contractor shall include a proposed preliminary specification for CLIN 2-1, 2-2, and 2-3, and shall be finalized in PDR (see Sect 5.3).

In the proposal, Contractor shall describe the feature and performance difference between the test equipment in simulating a user terminal and a feeder terminal, versus a real user terminal and a real feeder terminal

In the Proposal, Contractor shall describe the proposed test concept of operation and the proposed extent of automation and test equipment documentation.

Contractor shall ensure that additional information about the product is shared with TASA during the design and development process.

Contractor shall execute the Taiwan Production Procurement as proposed in the Contractor's proposal, including but not be to the limit, Taiwan venders and amount to be subcontracted to Taiwan vendors. The success of Taiwan production shall be the Contractor's responsibility.

The Taiwan Production Procurement execution plan shall be a part of the program management review and the execution status shall be provided in the status or progress report of each milestone to TASA.

The test equipment shall be compliant with the following sets of requirements.

- Receiver Frequency - Transmitter Frequency - EIRP - Sidelobe - Polarization - Cross polarization - Beams - G/T - Scan Range - Grating lobes	17.7-20.2 GHz 27-30 GHz 50 dBW <-20dBc at boresight LHCP or RHCP (Must be consistent with payload) ≧25dB at boresight 2 Rx Beams, 1 Tx Beam for handoffs or switching between orbits or constellation ≧11dB/K +/- 60 degrees None for 60 degrees scan range	Verify by test
Tx/Rx Modulation - Waveform - Modulation / Coding - Data Rate	 DVB-S2X or any waveforms compatible with 3GPP LTE or 5G NTN systems QPSK, 8PSK, 16APSK, 32APSK, 64APSK (Including but not limited) / LDPC, adaptive modulation and coding (AMC) schemes (Including but not limited) ≧50Mbps for TX; ≧50Mbps for RX	Verify by test

5 Milestones

The Contractor shall ensure that during the course of the design and the development additional information of the product is shared with the TASA. This will typically be at

Progress Review	Review Meeting Due Date (WSD + required time) Month
Kick-off	WSD+1
SRR	WSD+2

PDR	WSD+5
FM CDR1	WSD+8
EDU MRR	WSD+10
EDU TRR	WSD+10
EDU Delivery (Acceptance 1, EDU)	WSD+13
FM CDR2	WSD+17
FM MRR	WSD+18
FM TRR	WSD+18
FM Pre-shipment Review (PSR)	WSD+23
FM Delivery (Acceptance 2, FM)	WSD+24
The Payload Support Service for Integration Test Support	TASA Notice after FM Acceptance + 4 months*
The Payload Support Service for End-to-End Test Support	TASA Notice after FM Acceptance + 8 months*
The Payload Support Service for the Satellite Mission Operation (Acceptance 3, AWCC)	2 weeks after B5G Satellite on the mission orbit +5 months*

WSD= Work Start Date= Contract Effective Date ("CED")
AWCC: All Work Completion Certificate (“AWCC”)

※Ground Test Equipment shall include the test equipment support the function of the user terminal and feeder terminal for the Payload ground test.

※Delivery date means the date on which the package will arrive at the TASA's doorstep.

※Acceptance Date means the date on which TASA approves and agrees to receive the Deliverables for completion of review.

※TASA will send a notice letter to start the work of CLIN 6-1 and CLIN6-2 within 3 months after the FM Acceptance with the approval from the management.

※The application of the CLIN 6-3 service and its corresponding price payment is contingent on the result of the launch. The work of CLIN 6-3 will start within two weeks after B5G Satellite successfully on the mission orbit

5.1 Kick-Off (KO)

It initializes the project. The technical proposals of the Contractor are compared to the specification requirements. It is checked that the industrial organization is compliant with the technical and quality assurance requirements.

Typically, within 1 month after procurement release, the TASA will enact the unit contract towards the Contractor (kick-off).

The Contractor proposal will be summarized with a Compliance Matrix for the different aspects of the bid, including technical specifications, quality assurance, documentation, test, SOW, etc. The customer will enact the contract towards the Contractor and releases the manufacturing.

At least the following contents shall be included in the Kick-off meeting data package:
1. Agenda
2. Organization
3. Schedule
4. Work Breakdown Structure (WBS)
5. Specifications
6. System Design Description
7. EEE parts stress / de-rating requirements
8. Qualification Status List
9. Product Assurance Plan
10. List of key persons.
11. List of equipment for the development
12. Project planning
13. Others
14. Issues and concerns

In preparation for the review, the Contractor shall deliver advance copies in electronic form of KO Report to TASA at least one week prior to the review. The review meeting will be executed at TASA or the Contractor 's site. It can also be executed by conference call as may be agreed by both parties if there is difficulty in traveling due to quarantine restrictions or force majeure.

5.2 System Requirement Review (SRR)

SRR Milestone Reviews, the unit design and Contractor activities will be assessed by the Contractor towards the fulfillment of the procurement / component specification. SRR Milestone Reviews shall include the following information and documentation:
- ■ Payload system requirement review
- ■ Payload mechanical configuration including stowed and deployed views
- ■ Payload mechanical configuration including optical, RF, and thermal radiator Fields-of-View
- ■ Payload electrical/electronic design

- Payload software design
- Payload Operating Modes
- Payload Fault Detection and Recovery
- Payload Budgets and Margins
  1. Payload Performance relative to specifications
  2. Mass
  3. Power
  4. Thermal
  5. Beam: pointing and knowledge
  6. RF link: Payload communication
  7. Contribution to Space vehicle resources: relays, telemetry stream, CPU memory, on-board data storage
  8. Contribution to Satellite System Performance Compliance Matrix

In preparation for the review, the Contractor shall deliver advance copies in electronic form of SRR Report to TASA at least one week prior to the review. The review meeting will be executed by conference call.

5.3 Preliminary Design Review (PDR)

In preparation for the preliminary design review, the Contractor shall deliver advance copies in electronic form of background documentation to the TASA/contactor at least one week prior to the review. It will focus on critical areas of the following issues:

- Design and interface presentation
- Heritage and heritage testing presentation
- Potential waivers / specification status
- Test planning and test procedures

The information shall include as a minimum:

- Detailed design description and block diagrams
- Interface circuit diagrams
- Mechanical design or manufacturing drawing
- Proposed specification updates
- Results of performance analysis and test result summary (if applicable)

During the preliminary design review the Contractor shall make available for insight wiring diagrams, manufacturing drawings and process documents to support detailed discussions. Since this kind of information is considered proprietary Contractor company information it will not be made a deliverable and copies will only be made with the agreement of the Contractor.

The review meeting will be executed at the Contractor 's site. It can also be executed by conference call as may be agreed by both parties if there is difficulty in traveling due to

quarantine restrictions or force majeure.

5.4 Critical Design Review (CDR)

CDR Milestone Reviews shall include the following information and documentation:

(a) Payload mechanical configuration including stowed and deployed views
(b) Payload mechanical configuration including optical, RF, and thermal radiator Fields-of View
(c) Payload electrical/electronic design
(d) Payload software design
(e) Payload Operating Modes
(f) Payload Fault Detection and Recovery
(g) Payload Budgets and Margins
1. Payload Performance relative to specifications
2. Mass
3. Power
4. Thermal
5. Beam: pointing and knowledge
6. RF link: Payload communication
7. Contribution to Space vehicle resources: relays, telemetry stream, CPU memory, on-board data storage
8. Contribution to Satellite System Performance Compliance Matrix

CDR1 shall include the following information and documentation:
- Preliminary Payload-Bus, Payload-UT, Payload-FT, Payload-SNOS ICDs
- Preliminary Test Plan for Payload at Contractor facility
- Preliminary Test Plan for Payload at TASA facility
- Preliminary Test Equipment design
- Preliminary Test Plan for Test Equipment
- Preliminary Payload-Test Equipment ICD
- Final Test Equipment Specification
- Test Plan Concept (including test of Payload at Contractor's and TASA's facility, and test of Test Equipment)
- Test Equipment Concept

CDR2 shall include the following information and documentation:

(h) Unit test result
(i) Payload-Bus, Payload-UT, Payload-FT, Payload-SNOS ICDs
(j) Test Plan for Payload at Contractor facility
(k) Test Plan for Payload at TASA facility
(l) Test Equipment design
(m) Test Plan for Test Equipment
(n) Payload-Test Equipment ICD

The review meeting will be executed at the Customer's site. It can also be executed by conference call as may be agreed by both parties if there is difficulty in traveling due to quarantine restrictions or force majeure.

5.5 Manufacturing Readiness Review (MRR)

MRR Milestone Reviews shall include, but not limited to the following information and documentation:

1. Identification of any discrepancies/changes of proposed solution;
2. Identification of any change to the testing strategy;
3. Delivery of the Manufacturing BOM;
4. Review of Manufacturing & Testing Schedule.
5. Review of Test plan and schedule
6. Program management and status (including schedule)
7. Compliance status of the requirement specification
8. A list of critical items / areas related to specification compliance (waivers), potential performance problems, potential exceeding of budgets / constraints, potential schedule risk.

The review meeting will be executed by conference call.

5.6 Test Readiness Review (TRR)

TRRs shall contain the following information and documentation as applicable:

(a) Payload configuration review
(b) The PCBA should be complete and accepted and the unit should be ready for final assembly or complete and ready for inspection.
(c) Status of Applicable Assembly, Integration and/or Test Procedures and Documentation
(d) Review of significant existing anomalies and all discrepancy reports on a subsystem basis
(e) Review of the schedule, content and anticipated results of integration and test activities
(f) Complete list of Mechanical Ground Support Equipment required including identification number (serial number, etc.), certification status, calibration dates and availability
(g) Complete list of Electrical Ground Support Equipment required including identification number (serial number, etc.), certification status, calibration dates,

and availability
(h) Status and configuration of test scripts and software
(i) Safety hazards and precaution
(j) Preliminary format documentation and sample data of Payload telemetry as recorded by Contractor's own test equipment

TRBs shall contain the following information and documentation:
(a) Test Data Review and Verification of Acceptability
(b) Review of significant test anomalies (closed) and all discrepancy reports (closed) on a module basis
(c) Review of all open test anomalies and discrepancy reports on a module basis
(d) Payload configuration review
(e) Review of integration and test activities for the upcoming program phase.

The review meeting will be executed by conference call.

5.7 Pre-Shipment Review (PSR)

Shipment preparation status shall be reviewed. A pre-shipment inspection shall be held in the frame of the Pre-Shipment Review. The Pre-Shipment Review will require an End Item Data Package (EIDP) to be delivered to TASA at least 2 weeks prior to Pre-Shipment Review for each flight hardware unit. The successful Pre-Shipment Review shall condition the final acceptance.

The Shipment review shall include, but not limited to, the following:

1. Review of Manufacturing & Testing results
2. Compliance status of the requirement specification
3. Identification of the compliance of requirements;
4. Identification of delivered documents;
5. Identification of delivered hardware;
6. Final version of all ICD's (including but not limited to ICD's for Test Equipment)
7. Recorded telemetry data from FM by Contractor's test equipment during the entire test at the Payload level, and the final documentation of the data format.
8. Update of Test Plan for Payload at TASA facility
9. Critique of TASA's Payload-Satellite Integration Plan, Payload Test at Satellite Level, In-Orbit Test Plan

Contractor's format will be acceptable.

The Pre-Shipment review will be held at the Contractor facility. It can also be executed by conference call as may be agreed by both parties if there is difficulty in traveling due to quarantine restrictions or force majeure. Upon EIDP receipt of the TASA will review the delivered documents in order to allow to provide the consent to ship.

5.8 Acceptance

A **preliminary acceptance** will be provided by the customer within 14 days after EIDP delivery based on:

- Complete delivery and acceptance of all documents including EIDP
- Consent to ship

Final acceptance will be provided by TASA based upon:

- Successful incoming inspection at TASA site
- Complete delivery and acceptance of all documents

Note: In case of a failure is from the delivered hardware and solution during the system test at TASA, the communication Payload (PL) shall be refurbished by the vendor under warranty. The test procedure is opened to Contractor and the test results are shared with Contractor. Repair/refurbishment is performed to the issues under Contractor's workmanship problem and responsibility.

Certificate of Acceptance as specified in Appendix IV Acceptance Criteria and Procedures. It allows checking configuration and health after delivery to TASA. Acceptance will be successful upon completion of TASA.

6 REQUIRED DELIVERABLES

The Contractor shall deliver the documents as specified in Appendix III Data Deliverables.

6.1 Deliverable Hardware List

The Contractor shall deliver the following flight hardware items at the indicated delivery date

Item	Description Hardware	Quantity	Delivery Due Date
CLIN 1	Payload Engineering Design Unit (EDU)	1 set	WSD+13month

CLIN 2-1	Ground Test Equipment (including the modem and test software or procedures running over the hardware to implement user terminal functions for Payload link)	2 set	WSD+13month
CLIN 2-2	Ground Test Equipment (including the modem and test software or procedures running over the hardware to implement feeder link functions for Payload link)	1 set	WSD+13month
CLIN 2-3	Ground Test Equipment (including hardware software procedure and documentation) to test Payload internals and interfaces during the satellite integration and test stage	1 set	WSD+**13**month
CLIN 3-1	Payload System Flight Model	1 set	WSD+24month
CLIN 3-2	User Terminals	20 set	WSD+24month
CLIN 3-3	Feeder Terminal	1 set	WSD+24month

Each hardware shall be delivered with the following additional equipment:

- Connector protective caps
- Connector savers
- Shipping container, readily re-configurable for return shipping
- Shock and temperature limit recording, accessible without opening the container

The following documentation shall be delivered at the same time as the hardware:

- As-built configuration, ICDs, waiver

6.2 Deliverable Software

The Contractor shall provide the software tool for communication Payload test with the valid license for operation.

Item	Description Software	Quantity	Delivery Date
CLIN 4-1	Software & Documentation (on Application Programming Interfaces (APIs)) and relevant documentation to enable operation and connectivity to the Payload) for EDU	1 Lot	WSD+13month
CLIN 4-2	Software & Documentation (on Application Programming Interfaces (APIs)) and relevant documentation to enable operation and connectivity to the Payload) for FM	1 Lot	WSD+24month

6.3 Training (CLIN 5)

The Contractor shall provide Training for TASA personnel. The training shall include the following as a minimum:

Item	Description	Delivery Date
CLIN 5-1 Operation training for EDU and test equipment	・The operation training for EDU and test equipment shall include: All nominal and contingency operations shall be described, together with principles, leading procedure, recommended steps sequence, and relevant telemetry and commands. ・All operating and command constraints at the system, subsystem or unit level should be proposed, including at least those related to functionality, interfaces, mechanics, thermal control, etc. ・Instructions and training on the operation and configuration of ground test equipment, including at least the block diagram, operation and use of user terminal and feeder terminal interfaces and software interfaces. ・Cover any questions that TASA has in the use and interfacing of the supplied Payload; ・Cover any questions that TASA are integrating the supplied equipment; ・Suggested methods of testing and integration of supplied product. ・User operating manual. ・The training package will be delivered on both paper and electrical media. ・The training shall be composed of theoretical and practical training. It is envisaged that the training will take place around the time frame of the communication Payload test at Contractor's site. In addition, the training should be completed no later than WSD+13 months, as documented by Contractor 's submitting the training report for TASA's review and acceptance and countersign the Service Completion Certificate (SCC).	WSD+13 month

CLIN 5-2 Operation training for FM and test equipment	・The operation training for FM and test equipment shall include: All nominal and contingency operations shall be described, together with principles, leading procedure, recommended steps sequence, and relevant telemetry and commands. ・All operating and command constraints at the system, subsystem or unit level should be proposed, including at least those related to functionality, interfaces, mechanics, thermal control, etc. ・The training shall be composed of theoretical and practical training, including Payload to user terminal and feeder terminal communication link verification. ・Instructions and training on the operation and configuration of ground test equipment, including at least the block diagram, operation and use of user terminal and feeder terminal interfaces and software interfaces. ・Cover any questions that TASA has in the use and interfacing of the supplied Payload; ・Cover any questions that TASA are integrating the supplied equipment; ・Suggested methods of testing and integration of supplied product. ・User operating manual. ・The training package will be delivered on both paper and electrical media. It is envisaged that the training will take place around the time frame of the communication Payload test at TASA facility. In addition, the Contractor complete the training no later than WSD+24 months, as documented by Contractor 's submitting the training report for TASA's review and acceptance and countersign the Service Completion Certificate (SCC).	WSD+24 month

6.4 Tasks for Required Services (CLIN 6)

The execution time for CLIN6 shall be Procurement Management Review document. The Contractor shall complete the required service within mutually agreed time frame in the appropriate Procurement Management Review document, subject to the respective deadlines as set out in sub-sections below. The Contractor shall be fully responsible for the delay if it is attributed to the Contractor.

Contractor shall provide updates on documentation, procedure, and software to resolve non-compliances (or issues) discovered after FM Acceptance, at Contractor's expense unless for causes attributed to TASA's fault. Contractor's obligation on providing hardware addition/repair/modification is governed by the Warranty clause.

The support scope at TASA facility described in the following subsections are in addition to the Contractor's work at Contractor's facility.

6.4.1 The Payload Integration Test Support Service (CLIN 6-1)

After the communication Payload is delivered to TASA, Contractor shall provide the on-site support to the functional check of Payload of the satellite in terms of function, form, and fit at TASA facility. The Payload functional test will be performed and completed in satellite level Payload comprehensive test, vibration test, thermal test, and EMC test per Contractor's support. The Contractor shall prepare the GSE package, test aid, and test harness (Not included in CLIN2-1, CLIN2-2, and CLIN2-3 and required for use) for Payload operation test at TASA facility. The Contractor shall verify the all provide GSE meets Payload test requirements. The Contractor shall deliver the communication Payload satellite level verification plan and associate as-run procedure template documents to TASA before the Payload test. The Contractor person shall support TASA team to conduct the test by following the satellite test plan. Contractor shall be responsible for timely trouble shooting, re-work, and anomaly resolution as well.

- CDRL Item(s): The communication Payload satellite level verification plan and the communication Payload satellite level test procedure.
- Equipment Lease(s): GSE package, Test aid, and Test harness (needed)
- Payload Integration Testing Support, including at least completion of satellite level Payload integration testing, vibration testing, thermal test, and EMC test at the TASA site.
- Troubleshooting support if abnormalities occur during testing at the TASA site.

The payload integration test support service should be performed at TASA site and shall be completed within a timeframe of TASA Notice after FM Acceptance + 4 months. Upon completion of the service, Contractor shall submit the corresponding service report for TASA's review and acceptance and to countersign the Service Completion Certificate (SCC). Contractor is responsible to deploy adequate manpower to timely

provide the service, provided that at least two persons from Contractor's team shall be on-site during the service period.

6.4.2 The Payload End-to-End Test Support Service (CLIN 6-2)

The Payload end-to-end test with TASA's ground system will be performed per Contractor's support. The Contractor shall support the Payload functional check and communication Payload mission test at TASA facility. The Contractor shall deliver the communication Payload end to end test and the Payload functional check and communication Payload mission test plan and procedure documents before the satellite end to end and communication Payload mission tests including communication Payload link to Contractor's user terminals and Taiwan manufacture's user terminals. The Contractor person will support the communication Payload test including Payload to Contractor's user terminals and Taiwan manufacture's user terminals link by following the end-to-end and communication Payload mission test plan.

Contractor shall submit the corresponding service report for TASA to countersign the Service Completion Certificate (SCC).

- CDRL Item(s): The communication Payload end to end test plan and the communication Payload end to end test procedure.

- Equipment Lease(s): GSE package, Test aid, and Test harness (needed)

- Review of how TASA are integrating the supplied equipment to allow perform access link and feeder link and make suggestions;

- The Payload End-to-End Test Support at TASA site, including at least completion of Payload to Ground End-to-End Testing and Troubleshooting if abnormalities occur during testing at TASA site. (the information provide in serves as a reference for price estimation only)

The Payload End-to-End Test Support should be performed at TASA site and shall be completed within a timeframe of TASA Notice after FM Acceptance + 8 months. Upon completion of the service, Contractor shall submit the corresponding service report for TASA to countersign the Service Completion Certificate (SCC). Contractor is responsible to deploy adequate manpower to timely provide the service, provided that at least two persons from Contractor 's team shall be on-site during the service period.

6.4.3 The Payload Support Service for the Satellite Mission Operation (CLIN 6-3)

Within two weeks after B5G Satellite successfully on the mission orbit, Contractor shall support the function check of the communication Payload for on-orbit satellite mission operations. Contractor shall be responsible for timely trouble shooting, and anomaly resolution

as well. Contractor shall submit the corresponding service report for TASA to countersign the Service Completion Certificate (SCC).

- Support the review of communication Payload operation procedure in the B5G satellite mission operation document.
- Mission Payload Operation Support for on-orbit satellite payload to user terminals (including Contractor's UT and Taiwan manufacture's UT) and feeder terminal communication and operation at the TASA site.
- Troubleshooting support if abnormalities occur during on-orbit satellite mission operations, on-orbit satellite payload to user terminals (including Contractor's UT and Taiwan manufacture's UT) and feeder terminal communication at the TASA site.

The Payload Support Service for the Satellite Mission Operation should be performed at TASA site and shall be completed within a timeframe of 2 weeks after B5G Satellite on the mission orbit + 5 months. Upon completion of the service, Contractor shall submit the corresponding service report for TASA's review and acceptance and to countersign the Service Completion Certificate (SCC). Contractor is responsible to deploy adequate manpower to timely provide the service, provided that at least two persons from Contractor 's team shall be on-site during the service period.

6.5 Destination of Delivery

All deliverable products and documents shall be delivered to TASA and the following address:
Address: 8F, 9 Prosperity 1st Road, Hsinchu Science Park, HsinChu, Taiwan, R.O.C.
TEL: +886-3-578-4208

All documentation shall also be delivered via electronic means in the PDF format.

Selected deliverables (to be mutually agreed) such as ICD, technical and financial budget, schedule, telemetry, and training shall also be delivered in native format such as Microsoft Word, Excel, or CAD. The format shall not restrict editing by TASA.

7 Acronym

AIV Authorised Internal Verifier

APSK Amplitude Phase Shift Keying

BOM Bill of Materials

CED Contract Effective Date

CDR	Critical Design Review
CI	Critical items
CLIN	Contract Line Item Numbers
DPA	Destructive Physical Analysis
ECCN	Export Control Classification Number
ECR	Engineering Change Request
EDU	Engineering Design Unit
EEE	Electrical, Electronic, and Electromechanical
EIDP	End Item Data Package
EIRP	Effective Isotropic Radiated Power
EMC	Electromagnetic Compatibility
ESD	Electrostatic Discharge
EQM	Engineering Qualification Model
EUT	Equipment Under Test
FM	Flight Model
FMECA	Failure Modes, Effects, and Criticality Analysis
FWHM	Full width at half maximum
FT	Feeder Terminal
GCR	Galactic Cosmic Radiation
GSE	Ground Support Equipment
ICD	Interface Control Document
ITAR	International Traffic in Arms Regulations
LET	Linear Energy Transfer
LHCP	Left Hand Circular Polarization
KIP	Key Inspection Point
KO	Kick-Off
MICD	Mechanical Interface Control Document
MIP	Mandatory Inspection Point
MRR	Manufacturing Readiness Review
NCR	Non-Conformance Report
Nop	Non-Operation
NSPAR	Non-Standard Part Approval Request

OBP	On-Board Processor
OCT	Optical Communication Terminal (inter-satellite or satellite-ground)
Op	Operation
PA	Product Assurance
PAD	Part Approval Document
PCBA	Printed Circuit Board Assembly
PDR	Preliminary Design Review
PIND	Particle Impact Noise Detection
PPL	Preferred Parts List
PSR	Pre-Shipment Review
PWBs	Printed Wiring Boards
QML	Qualified Manufacturers List
QPL	Quali-fied Parts List
QPSK	Quadrature Phase Shift Keying
RHCP	Right Hand Circular Polarization
RFW	Request for Waiver
SCC	Service Completion Certificate
SEE	Single Event Effects
SEP	Solar Energetic Particle
SNOS	Satellite Network Operation System
SoCs	System on a Chips
SRR	System Requirement Review
TASA	Taiwan Space Agency
TT&C	Telemetry, Tracking, and Command
TRR	Test Readiness Review
UT	User Terminal
WBS	Work Breakdown Structure
WSD	Work Start Date

Appendix III

Data Deliverables

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1. Introduction

1.1. Purpose

This document defines the data deliverables of this contract.

1.2. Scope

The data deliverables cover all the documents required for the SOW specified in the Appendix III.

2. Related Documents

2.1. Applicable Documents

N/A

2.2. Reference Documents

N/A

3. Data Deliverables

The data deliverables shall be prepared, maintained, and delivered to the TASA in accordance with the requirements set forth in this attachment. The data deliverables for the project, including the End Item Data Package (EIDP), are listed in Contract Data Requirement List (CDRL). The EIDP is the collection of documents that shall be delivered with hardware shipment for the case that the Contractor is responsible for the hardware delivery. The detailed review and approval procedures for CDRL items are specified in Appendix VI: Acceptance Criteria and Procedures.

4. General Requirements

4.1. Data Deliverables Format

Unless otherwise explicitly specified in the followings, the Contractor's format for the data deliverables is acceptable.

4.1.1. Electronic files

Unless otherwise specified, the disk copy of electronic files shall be in the editable and unprotected text type Portable Document Format (.pdf) by Adobe Acrobat. For code 1 CDRL items, the Microsoft Office 2000 or upgrade version for PC Windows format

shall be provided in addition to the PDF files. Scanned PDF files will be acceptable for the test reports with written test results and signature entries.

4.1.2. Engineering Drawings

The electronic file for engineering drawings shall be either in CREO PTC, or that can be readable by those programs.

The electronic files for electrical schematics and PCB layout drawing shall be Cadence OrCAD compatible.

4.2. End Item Data Package

An End Item Data Package (EIDP) shall be delivered to TASA with flight hardware shipment. In general, the contents of EIDP include, but not limit to, the following:

(1) Approval Signature and Certificates of Conformance (COC).

(2) Shipping Package: shipping documents, identification of delivered items, etc.

(3) Log sheets

(4) As-Built Status List (applicable and relevant document list (specifications, technical notes, manuals, reports, plans, test procedures / reports, etc.)

(5) Design Package: development plan, design reports, specifications, etc.

(6) Manufacturing Package: manufacturing plan and procedures, as-designed, as-built and as-shipped configuration, assembly kitting lists, travelers, bill of material, part lists, mechanical installation list, etc.

(7) Verification Package: requirement verification plan, analysis reports, test plan and procedures, inspection data and reports, test data and reports, operating time records, calibration records and evidences for test equipment and instruments, proof load test records and evidences for load bearing items, etc.

(8) Product Assurance Package: discrepancy report, non-conformance report, failure reports, hazard report, MRB and FRB logs, waivers/deviation log, CCB log, etc.

(9) Operation Package: user manual, installation procedures, etc.

(10) Maintenance Package: warranty plan, maintenance plan, maintenance procedures, troubleshooting and diagnosis guidelines, etc.

(11) Other technical documents related to the delivered equipment, if any

The Contractor format will be acceptable for each End Item Data Package. During the product procurement phase all related product documentation (design, manufacturing and maintenance documentation) will be delivered to TASA or made available for insight and review. The documents already delivered during the procurement phase need not to be delivered additionally inside the EIDP.

4.3. Document Identification

Each data deliverable is identified with a CDRL number as the document number. The document number, change legend, title, and date constitute the minimum identification requirement of the specific document and shall appear on the title page.

Contractor may use his own document numbering system to define the document number. Both CDRL number specified in this attachment and Contractor's document number shall be identified on the front (title page) of each document if Contractor uses his own document numbering system as the document number.

The contract number and the content name and designation shall also appear on the title page as separate markings. In addition, the originator and organization shall also be included on the title page.

The document number (either CDRL number or Contractor's document number), change legend, title, date, and page number shall appear on each page of the document.

Successive issues or revision of documents shall be identified in the same manner as the basic issue and shall have the appropriate change identification. Engineering drawings are excluded from the marking provisions of this paragraph.

A four digits series code constitute the change legend of the CDRL number. The first 2 digits constitute an issue number, and the last two digits constitute a revision number. The specific issue number of the CDRL items need to be submitted by Contractor in conjunction with milestone schedule is specified by TASA. After the required submission and before the next submitted schedule, Contractor may make the data changes and submission, if required, with the last two digits revision number starting from sequential number 01.

For example:

CDRL Number	CDRL Title	Issue / Revision	Meaning
xxxx-CDRL-001	[Title]	0000	First Issue (prescribed by TASA)
		0001	First Revision After First Issue
		0100	Second Issue (prescribed by TASA)
		0101	First Revision After Second Issue

4.4. Documentation Approval Code

Contractor shall be responsible for the resolution of the action items raised by TASA. Contractor shall also resolve errors and omissions in the data that have been reviewed and identified by the TASA. There are two codes, code 1 and code 2, as shown in the table below.

Notice of approval about approval code 1 items shall be given within two (2) weeks after data delivery except there is any questions or comments. Those data items requiring TASA approval code 1 will not be accepted until questions and comments regarding the data have been resolved.

Approval Code	Description
1	Data submitted to the TASA as declaration of successful completion of equipment or service tasks in the SOW and other contract documents. Notice of acceptance of the final version of CDRL item will be issued by the TASA in writing following the successful completion of the review and satisfactory closure of the action item(s), if any, by Contractor.
2	Data submitted to the TASA as declaration of successful completion of a service or equipment tasks of the Contract. Formal notice of acceptance by the TASA is not required.

4.5. Delivery and Distribution of Data

Unless otherwise specified, Contractor shall send one (1) electronic files disk copy of data to TASA. In the event that the CDRL items generated by Contractor is not consistent with the requirements provided or cannot be delivered on time, Contractor shall notify TASA thirty (30) or more days prior to the delivery of the item. The duplication and distribution of data will be done by TASA.

4.6. Cost of Data

Except as otherwise provided, the cost of data to be furnished in response to the data deliverable is included in the price of the Contract.

4.7. Data Not Required by the Contract

Additional data generated within the normal course of contract work, which is not a part of the data required by the Contract, shall be made available to TASA upon request. The contents shall be by mutual agreement between TASA and Contractor for each specified task.

5. CDRL Items

The CDRL Items are listed in Table 5-1.

Table 5-1. CDRL List

CDRL Item	Description	Approval Code	Delivery Date
001	Kick Off Report	1	KO
002	Payload Performance Analysis	1	KO
003	Monthly Program Status	2	Monthly
004	Milestone Review Data Package	2	Each Milestone Review
005	Payload Requirements	1	SRR
006	Payload System Operations Concept	2	PDR
007	Payload ICD	1	PDR
008	Payload Network Operations ICD	1	PDR
009	Payload System Verification Plan and Matrix	1	PDR
010	Payload Thermal Analysis and Reports	2	PDR
011	Payload Structural Analysis	2	PDR
012	Payload Failure Modes Effects Criticality Analysis (FMECA)	2	PDR
013	Payload Critical Items List (CIL)	2	PDR
014	Payload Reliability Assessment	2	PDR
015	Payload EDU Test Report	2	EDU Delivery
016	Payload EDU User Manual	1	EDU Delivery
017	Payload GSE Technical Requirements	1	EDU Delivery
018	Payload EDU Operation Training Report	1	EDU Delivery
019	Payload GSE User's Guide (excluding Flight Software)	1	EDU Delivery
020	FM CDR Report	1	CDR2
021	Payload Flight Model Drawing List	1	CDR2
022	Payload Flight Model Design Description Document	1	MRR/TRR
023	Payload Flight Model AIT Plan	1	MRR/TRR
024	Payload Flight Model Test Specifications and Procedures	1	MRR/TRR
025	Payload Test Report	1	FM Delivery
026	EIDP package	1	PSR-1M (for draft) and FM Delivery (for final)
027	Consent to Delivery Review (DR) Report	1	PSR
028	Payload Flight Model Operation Training Report	1	FM Delivery

029	Payload Operating Time and Telemetry Record	1	FM Delivery
030	Payload Integration Test Support Service Report	1	TASA Notice after FM Acceptance + 4 months*
031	Payload End-to-End Test Support Service Report	1	TASA Notice after FM Acceptance + 8 months*
032	Payload Support Service for the Satellite Mission Operation Report	1	2 weeks after B5G Satellite on the mission orbit +5 months*

Note*:

1. TASA will send a notice letter to start the work of CLIN 6-1 and CLIN6-2 within 3 months after the FM Acceptance with the approval from the management.

2. The application of the CLIN 6-3 service is contingent on the result of the launch. The work of CLIN 6-3 will start within two weeks after B5G Satellite successfully on the mission orbit

Appendix IV

Acceptance Criteria and Procedures

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1. Introduction

1.1. Purpose

This document contains requirements and procedure for acceptance of the work performed by the Contractor for communication payload.

1.2. Scope

The requirements cover Communication Payload Ground Test Equipment.

1.3. Definition

Completion and acceptance of program milestones and tasks in the CLIN Items are subject to be certified by four types of Certifications, which are defined as following.

Certificate of Conformance (COC): COC is the certificate for completion and acceptance of Hardware that do not need tests at TASA. Certificate shall be issued by Contractor after successful completion of inspections and document submittal of each required Hardware and ordered optional equipment and countersigned by TASA.

Service Completion Certificate (SCC): SCC is the Service Completion Certificate for each service task. Fulfillment of the service should be signified by completion of appropriate data and reports. TASA will duly countersign the SCCs upon completions of all necessary reviews and approval processes.

Milestone Completion Certificate (MCC): MCC is the Milestone Completion Certificate to certify that all required milestone tasks. TASA will duly countersign the MCCs upon completions of all necessary reviews and approval processes. One Milestone Completion Certificate (MCC) shall be issued for each Progress Review.

All Work Completion Certificate (AWCC): AWCC is the certificate for completion of all Contract works. Certificate shall be issued by Contractor after completion and acceptance of all Contract works and countersigned by TASA Project Manager (PM) at TASA

Completion and Acceptance of the CLIN Items shall require the documents specified in the table below.

Table 1.1: Completion and Acceptance Certifications for CLIN Items

CLIN Items	**Required Completion Certificate (COC/SCC)**
CLIN 1: Engineering Design Unit (EDU)	**COC#1**
CLIN 2-1: Ground Test Equipment 1	**COC#2**
CLIN 2-2: Ground Test Equipment 2	**COC#3**
CLIN 2-3: Ground Test Equipment 3	**COC#4**
CLIN 3-1: Payload System Flight Model	**COC#5**
CLIN 3-2: User Terminals	**COC#6**
CLIN 3-3: Feeder Terminal	**COC#7**
CLIN 4-1: Software &Documentation for EDU	**COC#8**
CLIN 4-2: Software &Documentation for FM	**COC#9**
CLIN 5-1: Training 1 for EDU	**SCC#1**
CLIN 5-2: Training 2 for FM	**SCC#2**
CLIN 6-1: Payload Integration Test Support Service	**SCC#3**
CLIN 6-2: Payload End-to-End Test Support Service	**SCC#4**
CLIN 6-3: Payload Support Service for the Satellite Mission Operation*	**SCC#5**

Note*: The application of the CLIN 6-3 service is contingent on the result of the launch.

Table 1.2: Milestone Completion Certificate

NO	**Progress Review**	**MCC**
0	Contract Effective Date	N/A
1	**Kick-off**	**MCC#1**
2	**SRR**	**MCC#2**
3	**PDR**	**MCC#3**
4	**FM CDR1**	**MCC#4**

5	**EDU MRR**	**MCC#5**
6	**EDU TRR**	**MCC#6**
	EDU Delivery (Acceptance 1, EDU)	N/A
7	**FM CDR2**	**MCC#7**
8	**FM MRR**	**MCC#8**
9	**FM TRR**	**MCC#9**
10	**FM Pre-shipment Review (PSR)**	**MCC#10**
	FM Delivery(Acceptance 2, FM)	N/A

Table 1.3: Completion and Acceptance Certifications for MCC/COC/SCC/AWCC Items

No.	MCC/COC/SCC/AWCC	Required Completion Certificate
1	**MCC#1 for Kick Off** **MCC#2 for SRR**	**MCC#1** **MCC#2**
2	**MCC#3 for PDR**	**MCC#3**
3	**Acceptance 1:** **MCC#4 for FM CDR1** **MCC#5 for EDU MRR** **MCC#6 for EDU TRR** **COC#1 of Engineering Design Unit (EDU)** **COC#2 of CLIN 2-1 Ground Test Equipment 1** **COC#3 of CLIN 2-2: Ground Test Equipment 2** **COC#4 of CLIN 2-3: Ground Test Equipment 3** **COC#8 of Software &Documentation for EDU** **SCC#1 for CLIN 5-1: Training 1 for EDU**	**MCC#4** **MCC#5** **MCC#6** **COC#1** **COC#2** **COC#3** **COC#4** **COC#8** **SCC#1**
4	**Acceptance 2:** **MCC#7 for FMCRD2** **MCC#8 for FM MRR**	**MCC#7** **MCC#8**

	MCC#9 for FM TRR **MCC#10 for FM PSR** **COC#5 of CLIN 3-1: Payload System FM** **COC#6 of CLIN 3-2: User Terminals** **COC#7 of CLIN 3-3: Feeder Terminal** **COC#9 of CLIN 4-2: Software &Documentation for FM** **SCC#2 for CLIN 5-2 Training 2 for FM**	**MCC#9** **MCC#10** **COC#5** **COC#6** **COC#7** **COC#9** **SCC#2**
5	**SCC#3 for CLIN 6-1: Payload Integration Test Support Service**	**SCC#3**
6	**SCC#4 for CLIN 6-2: Payload End-to-End Test Support Service**	**SCC#4**
7	**Acceptance 3:** **SCC#3 for CLIN 6-3: Payload Support Service for the Satellite Mission Operation* All MCC/COC/SCC done**	**SCC#5** **AWCC**

Note*: The application of the CLIN 6-3 service is contingent on the result of the launch.

2. Related Documents

2.1. Applicable Documents

N/A

2.2. Reference Documents

N/A

3. Acceptance Certification

3.1. Milestone Completion Certification

Upon completion of all Milestone tasks and documents for each program phase, Contractor shall issue a Milestone Completion Certificate (MCC) to certify that all required milestone tasks have been successfully completed. One Milestone Completion Certificate (MCC) shall be issued for each Progress Review.

TASA will countersign the MCC upon the following criteria:

(1). Satisfactory completion of the required tasks, inclusive of all preceding tasks as specified in the SOW for each CLIN Item.

(2). Satisfactory closeout of Request for Action imposed to the Contractor and that was due in the relevant reviewed period.

(3). Approval of the relevant data and documents specified in the SOW for each CLIN Item.

(4). Countersignature of COC/SCC, if any.

If any item does not comply with the requirements of the Contract, TASA will state them on the MCC. In such event of non-compliance, Contractor shall make any necessary correction or revision. The date on which TASA countersigns the respective Milestone Completion Certificate (MCC) shall denote the actual successful completion date for such milestone.

MCC#1: Completion of MCC for Kick Off

The Certificate of Milestone Completion for the MCC#1 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

CDRL-001 /CDRL002

– Completion of documents as specified in Appendix III Table 5-1

CDRL-003 / CDRL-004

MCC#2: Completion of MCC for SRR

The Certificate of Milestone Completion for the MCC#2 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

CDRL-005

– Completion of documents as specified in Appendix III Table 5-1

CDRL-003 / CDRL-004

MCC#3: Completion of MCC for PDR

The Certificate of Milestone Completion for the MCC#3 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

CDRL-007 / CDRL-008/ CDRL-009

– Completion of documents as specified in Appendix III Table 5-1

CDRL-003 / CDRL-004 / CDRL-006 / CDRL-010~014

MCC#4: Completion of MCC for FM CDR1

The Certificate of Milestone Completion for the MCC#4 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

N/A

– Completion of documents as specified in Appendix III Table 5-1

CDRL-003 / CDRL-004

MCC#5 : Completion of MCC for EDU MRR

The Certificate of Milestone Completion for the MCC#5 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

N/A

– Completion of documents as specified in Appendix III Table 5-1

CDRL-003 / CDRL-004

MCC#6: Completion of MCC for EDU TRR

The Certificate of Milestone Completion for the MCC#6 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

N/A

– Completion of documents as specified in Appendix III Table 5-1

CDRL-003 / CDRL-004

MCC#7: Completion of MCC for FM CDR2

The Certificate of Milestone Completion for the MCC#7 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

CDRL-020/ CDRL-021

– Completion of documents as specified in Appendix III Table 5-1

CDRL-003 / CDRL-004 / CDRL-015

MCC#8: Completion of MCC for FM MRR

The Certificate of Milestone Completion for the MCC#8 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

CDRL-022 / CDRL-023 / CDRL-024

– Completion of documents as specified in Appendix III Table 5-1

CDRL-003 / CDRL-004

MCC#9: Completion of MCC for FM TRR

The Certificate of Milestone Completion for the MCC#9 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

CDRL-022 / CDRL-023 / CDRL-024

– Completion of documents as specified in Appendix III Table 5-1

CDRL-003 / CDRL-004

MCC#10: Completion of MCC for FM PSR

The Certificate of Milestone Completion for the MCC#10 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

CDRL-026/ CDRL-027

– Completion of documents as specified in Appendix III Table 5-1

CDRL-003 / CDRL-004

3.1.1. General Requirements

After completion of the respective task and documents for each hardware, a Certificate of Conformance (COC) shall be subject for TASA's review and verification and shall be countersigned by the TASA. The criteria and conditions for countersigning each COC are described in the following sub-sections. The" Acceptance of hardware" are described in the SOW. Acceptance criteria and procedures for "Documentation Review and Approval Procedures" are described in the APPENDIX III (Data Deliverables)

3.1.2. COC

Upon completion of the respective tasks, document submittals, delivery for the Hardware, Contractor shall issue the Certificate of Conformance. COC will be countersigned by TASA upon the following:

(1). Completions of Review of Certificates of Conformance and other Shipping Documents for Products in Shipment.

(2). Completion of Identification and Visual (ID&V) Inspection for Products in Shipment.

(3). Completion of Review and Approvals of EIDP and related Documentation as specified in SOW of this Contract.

COC#1: CLIN 1 Completion of Engineering Design Unit (EDU)

The Certificate of Milestone Completion for the COC#1 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

CDRL-016 / CDRL-017 / CDRL-018/ CDRL-019

– Completion of documents as specified in Appendix III Table 5-1

CDRL-015

COC#2: CLIN 2-1 Completion of Ground Test Equipment 1

The Certificate of Milestone Completion for the COC#2 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

N/A

– Completion of documents as specified in Appendix III Table 5-1

N/A

COC#3: CLIN 2-2 Completion of Ground Test Equipment 2

The Certificate of Milestone Completion for the COC#3 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

N/A

– Completion of documents as specified in Appendix III Table 5-1

N/A

COC#4: CLIN 2-3 Completion of Ground Test Equipment 3

The Certificate of Milestone Completion for the COC#4 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

N/A

– Completion of documents as specified in Appendix III Table 5-1

N/A

COC#5: CLIN 3-1 Completion of Payload System Flight Model

The Certificate of Milestone Completion for the COC#5 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

CDRL-026/ CDRL-028/ CDRL-029

– Completion of documents as specified in Appendix III Table 5-1

N/A

COC#6: CLIN 3-2 Completion of User Terminals

The Certificate of Milestone Completion for the COC#6 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

N/A

– Completion of documents as specified in Appendix III Table 5-1

N/A

COC#7: CLIN 3-3 Completion of Feeder Terminal

The Certificate of Milestone Completion for the COC#7 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

N/A

– Completion of documents as specified in Appendix III Table 5-1

N/A

COC#8: CLIN 4-1 Completion of Software &Documentation for EDU

The Certificate of Milestone Completion for the COC#4 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

N/A

– Completion of documents as specified in Appendix III Table 5-1

N/A

COC#9: CLIN 4-2 Completion of Software &Documentation for FM

The Certificate of Milestone Completion for the COC#5 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

N/A

– Completion of documents as specified in Appendix III Table 5-1

N/A

3.1.3. SCC

SCC is the Service Completion Certificate for each service task. Fulfillment of the service should be signified by completion of appropriate data and reports. TASA will duly countersign the SCCs upon completions of all necessary reviews and approval processes.

SCC#1: CLIN 5-1 Completion of Training for FM

The Certificate of Milestone Completion for the SCC#1 shall certify the fulfillment of the following contract requirements:

- Approval of documents as specified in Appendix III Table 5-1

  N/A

- Completion of documents as specified in Appendix III Table 5-1

  N/A

SCC#2: CLIN 5-2 Completion of Training for EDU

The Certificate of Milestone Completion for the SCC#2 shall certify the fulfillment of the following contract requirements:

- Approval of documents as specified in Appendix III Table 5-1

  N/A

- Completion of documents as specified in Appendix III Table 5-1

  N/A

SCC#3: CLIN6-1 Completion of Payload Integration Test Support Service

The Certificate of Milestone Completion for the SCC#3 shall certify the fulfillment of the following contract requirements:

- Approval of documents as specified in Appendix III Table 5-1

  CDRL-030

- Completion of documents as specified in Appendix III Table 5-1

  N/A

SCC#4: CLIN6-2 Completion of Payload End-to-End Test Support Service

The Certificate of Milestone Completion for the SCC#4 shall certify the fulfillment of the following contract requirements:

- Approval of documents as specified in Appendix III Table 5-1

  CDRL-031

- Completion of documents as specified in Appendix III Table 5-1

  N/A

SCC#5: CLIN6-3 Completion of Payload Support Service for the Satellite Mission Operation

The Certificate of Milestone Completion for the SCC#5 shall certify the fulfillment of the following contract requirements:

– Approval of documents as specified in Appendix III Table 5-1

  CDRL-032

– Completion of documents as specified in Appendix III Table 5-1

  N/A

3.2. Acceptance of All Work

Upon successful completion of all works, Contractor shall issue the All Work Completion Certificate (AWCC). The AWCC will be countersigned by the TASA upon the following:

(1). All COCs duly countersigned

(2). All SCCs duly countersigned

(3). All MCCs duly countersigned

3.3. Acceptance Procedures for Hardware

Acceptance procedures include receiving of hardware, receiving operation and receiving inspection. TASA will only accept the Hardware upon successfully completing all the procedures.

3.3.1. Receiving of Hardware

3.3.1.1.Shipping Operation

For shipment of any deliverable products, including repaired or replaced items; Contractor shall sign a Certificate of Conformance (COC) to assure that:

(1). Items have successfully passed applicable inspections and tests in accordance with the applicable specifications and procedures of the requirements of the Contract

(2). Items are correctly preserved, packaged, packed, and marked in accordance with applicable specifications and procedures.

3.3.1.2.Shipping Document

Whenever the submission of shipping documents is required, the following documents shall be included:

(1). A Packing List in two (2) copies.

(2). A Certificate of Conformance in two (2) copies

(3). A full set copy of clean airway bill(s) made out to order of / consigned to TASA marked "freight prepaid," notifying same, in proof of delivery of the relevant Contract Line Item(s) at the DPU TASA Jobsite

(4). A copy of the insurance policy covering from the point of export to the point of destination until TASA's acceptance of such Contract Line Item(s) for all risks including institute cargo clauses, institute strike clauses and institute war clauses for 110 % of the value of the Contract Line Item(s) in shipment, evidencing actual insurance premium fully paid.

(5). Contractor's certificate that the Certificate of Conformance, Packing List, the non-negotiable clean airway bill(s), and all-risks Insurance Policy have been air-mailed to TASA.

3.3.2. Receiving Operations

Upon arrival of shipped hardware at TASA, TASA's person will perform off-loading of the equipment if required, inspect the shipping container(s) and equipment to assure that such item complies with the COCs and the Packing List.

Note: re-assembly, and checkout and set the item to appropriate status is not necessary for all type of delivered items.

3.3.3. Receiving Inspection

The Receiving Inspection will be performed by TASA, and will begin after opening the packages and transiting the items to the appropriate place and finish the assembly and installation tasks.

There are two types of Receiving Inspection:

(1). Identification and Visual (ID&V) Inspection and

(2). The acceptance tests will be performed if need.

3.3.3.1.ID&V Inspection

The ID&V Inspection consists of inspection verification for shipping container quality, type and number of equipment, outer surface conditions (general workmanship and evidence of damage), part/hardware marking or identification (as applicable), packaging, etc., in accordance with the contract requirements.

TASA shall conduct inspection of hardware packaging and containers for damage upon arrival into any TASA work area. When damage of the contents is suspected, TASA shall notify Contractor before opening.

TASA will verify that the container is identified with a part number, and applicable shipping documents and Factory Accepted Tags are present.

TASA shall be responsible for the container opening procedure. The container shall be carefully opened (unless prohibited by a warning label, project direction, or it would violate the hermetic seal of the packaging) in accordance with applicable procedures.

NOTE: Any Applicable Precautions and Checklists during the process shall be followed.

All electronic, electromechanical, and electrical hardware will be inspected only on workstations certified for handling ESD items. If there contain additional inspection requirements, then those requirements shall also be applied.

After transit to the appropriate site, TASA shall conduct an ID&V Inspection to inspect the equipment for damage, using the applicable Receiving Inspection Procedures and Checklists.

After removal of any Environmental Data Measurement Device within shipping containers, the transportation environmental data shall be inspected and checked in accordance with applicable requirements.

TASA will perform the ID&V Inspection processes and identify the rejected items and process of such items in accordance with applicable PA procedures.

If any damage, shortage, discrepancy, non-conformity, misidentification of good, or misdirected good, etc., is found, Contractor shall be promptly informed and shall provide prompt repair or replacement at Contractor's own cost and responsibility, including transportation cost from and to TASA.

Upon completion of the ID&V Inspection for each shipment and upon completion of the necessary correction, TASA shall provide an "ID&V Receiving Inspection Report" and start to conduct the Acceptance Inspections and Tests for Hardware in shipment.

3.3.3.2. Acceptance Inspections

The Acceptance Inspections include physical/dimensional characteristics measurement, review of functional and performance parameter test data, and/or other inspection.

TASA reserves the right to conduct the re-verification of physical/dimensional characteristic measurement, functional and performance parameter tests, operability testing, and other necessary inspections and tests data

Any damage, shortage, discrepancy, or non-conformity found during acceptance inspections and tests for the required and ordered optional Hardware, for which the Contractor is responsible, shall promptly be corrected in accordance with the contract term.

3.4. Documentation Review and Approval Procedures

3.4.1. General Requirements

Unless otherwise specified, TASA will review and approve all related data and documents that are deliverable under the Contract. The documents include Shipping Documents, CDRL Items, End Item Data Package (EIDP) (as defined in Data Deliverable of this Contract), and other documents mutually agreed by TASA and Contractor for each specified item.

3.4.2. Documentation Approval

Documents to be fulfilled for each Program Milestone can be divided into two groups. The CDRL Item with approval code “1”, Other versions of CDRL Item with approval code “1”, CDRL Item with approval code “2”, and documents that do not require formal notice of acceptance by TASA are in the "Completion" group. Note that, the convention to identify various updated versions of CDRL Items as defined in “Data Deliverables”, shall be adapted. Documents that require TASA Approval or Completion Countersignature for the acceptance of each Milestone Completion Certification are summarized and listed in “Data Deliverables”.

3.4.3. Documentation Review

Upon receiving of data and document, TASA will distribute them to responsible personnel in TASA for review. All review comments will be collected, summarized, and fed back to Contractor by the TASA. Contractor shall make any necessary correction or revision for any rejection.

After review and approval of the Shipping Documents, EIDP, together with other relevant requirements, TASA will countersign the applicable Acceptance Certificates (COC) issued by Contractor.

Appendix V

Payment Schedule

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Appendix IV Payment Schedule

1 Summary of Payment Schedule:

Payment No.	MCC/COC/AWCC	Payment Amount
1	MCC#1 for Kick Off MCC#2 for SRR	10% of Item 110
2	MCC#3 for PDR	10% of Item 110
3	MCC#4 of FM CDR1 MCC#5 for EDU MRR MCC#6 for EDU TRR COC#1 of CLIN 1 COC#2 of CLIN 2-1 COC#3 of CLIN 2-2 COC#4 of CLIN 2-3 COC#8 of CLIN 4-1 SCC#1 for CLIN 5-1	20% of Item 110
4	MCC#7 of FM CDR2 MCC#8 for FM MRR MCC#9 for FM TRR MCC#10 for FM PSR COC#5 for CLIN 3-1 COC#6 for CLIN 3-2 COC#7 for CLIN 3-3 COC#9 of CLIN 4-2 SCC#2 for CLIN 5-2	30% of Item 110
5	SCC#3 for CLIN6-1	10% of Item 110
6	SCC#4 for CLIN6-2	10 % of Item 110
7	SCC#5 for CLIN6-3 AWCC	10% of Item 110 Or

		10% of Item 110 - 100% of Item 106-c (the contract price of CLIN6-3)

- Item 110: The total Contract price, sum of contract price of CLIN1, CLIN2, CLIN 3, CLIN4, CLIN 5, and CLIN 6, in 1.1 Price Summary of CLINs of Appendix I Contract Price Breakdown with Taiwan Taxes included.
- The application of the CLIN 6-3 service and its corresponding price payment is contingent on the result of the launch.
- MCC: Milestone Completion Certificate
- COC: Certificate of Conformance
- SCC: Service Completion Certificate
- AWCC: All Work Completion Certificate

2 Payment Schedule

2.1 Payment #1

The payment shall be 10% of the Contracted Price Breakdown Item 110 and shall be effective within thirty (30) days after the presentation of the following documents by the Contractor:

- The Contractor’s invoice in one (1) copies;
- The original duly countersigned MCC#1 for Kick Off, and MCC#2 for SRR.

2.2 Payment #2

The payment shall be 10% of the Contracted Price Breakdown Item 110 and shall be effective within thirty (30) days after the presentation of the following documents by the Contractor:

- The Contractor's invoice in one (1) copies;
- The original duly countersigned MCC#3 for PDR.

2.3 Payment #3

The payment shall be 20% of the Contracted Price Breakdown Item 110 shall be effective within thirty (30) days after the presentation of the following documents by the Contractor:

- The Contractor's invoice in one (1) copy;
- The original duly countersigned MCC#4 for CDR1, MCC#5 for EDU MRR, and MCC#6 for EDU TRR;
- The original duly countersigned COC#1 of CLIN 1, COC#2 of CLIN 2-1, COC#3 of CLIN 2-2, COC#4 of CLIN 2-3, and COC#8 of CLIN 4-1;
- The original duly countersigned SCC#1 for CLIN 5-1.

2.4 Payment #4

The payment shall be 30% of the Contracted Price Breakdown Item 110 shall be effective within thirty (30) days after the presentation of the following documents by the Contractor:

- The Contractor's invoice in one (1) copy;
- The original duly countersigned MCC#7 for FM CDR2, MCC#8 for FM MRR, MCC#9 for FM TRR, and MCC#10 for FM PSR;
- The original duly countersigned COC#5 of CLIN 3-1, COC#6 of 3-2, COC#7 of CLIN 3-3, and COC#9 of CLIN 4-2;
- The original duly countersigned SCC#2 for CLIN 5-2.

2.5 Payment #5

The payment shall be 10% of the Contracted Price Breakdown Item 110 and shall be effective within thirty (30) days after the presentation of the following documents by the Contractor:

- The Contractor's invoice in one (1) copy;
- The original duly countersigned SCC#3 for CLIN 5-1.

2.6 Payment #6

The payment shall be 10% of the Contracted Price Breakdown Item 110 and shall be effective within thirty (30) days after the presentation of the following documents by the Contractor:

- The Contractor's invoice in one (1) copy;
- The original duly countersigned SCC#4 for CLIN 6-2.

2.7 Payment #7

Since the application of the CLIN 6-3 service and its corresponding price payment is contingent on the result of the launch, the Payment #7 shall be 10% of the Contracted Price Breakdown Item 110, or 10% of the Contracted Price Breakdown Item 110 minus 100% of the Contracted Price Breakdown Item 106-c. The Payment #7 shall be effective within thirty (30) days after the presentation of the following documents by the Contractor:

- The Contractor's invoice in one (1) copy;
- The original duly countersigned SCC#5 for CLIN 6-3, which may not be required;
- The original duly countersigned AWCC.