Attachment M

Milestone Payment Events, Performance-Based Payment Schedule, and Completion Criteria

TO BE SUBMITTED IN PRICE PROPOSAL

Milestone Payment Schedules

The offeror shall provide interim payment events and associated completion criteria that flow into the Government provided major payment events listed in Table 1.1, Table 1.2, Table 1.3, and completion criteria listed in Table 2.1, Table 2.2, and Table 2.3. Performance events shall be meaningful efforts and actions. Performance-based payment amounts shall be commensurate with the value of the performance event. The total percentage of payments proposed for all events, both major and interim, shall not exceed 100% of the Total Firm Fixed Price value. The cumulative payment percentage for any fiscal year must not exceed the Cumulative Funding Profile of Attachment F, Funding Profile.

Table 1.1 Performance Based Payment Schedule for CLIN 001 Flight Instrument

Event No.	ATP + [X] Months	Milestone Payment Event	Payment Percent	Payment Amount	Cumulative Payment
1	[TBP]	Kickoff Meeting	[TBP]%	$[TBP]	$[TBP]
2	[TBP]	System Requirements Review (SRR)	[TBP]%	$[TBP]	$[TBP]
3	[TBP]	Preliminary Design Review (PDR)	[TBP]%	$[TBP]	$[TBP]
4	[TBP]	Engineering Development Unit (EDU) Complete	[TBP]%	$[TBP]	$[TBP]
5	[TBP]	Critical Design Review (CDR)	[TBP]%	$[TBP]	$[TBP]
6	[TBP]	Pre-Environmental Review (PER)	[TBP]%	$[TBP]	$[TBP]
7	[TBP]	FM-1 Pre-Shipment Review (PSR)	[TBP]%	$[TBP]	$[TBP]
8	[TBP]	FM-2 Delivery	[TBP]%	$[TBP]	$[TBP]

Table 1.2 Performance Based Payment Schedule for CLIN 002 Flight Instrument

Event No.	ATP + [X] Months	Milestone Payment Event	Payment Percent	Payment Amount	Cumulative Payment
9	[TBP]	Observatory Pre-Storage Review	[TBP]%	$[TBP]	$[TBP]
10	[TBP]	Observatory Pre-Shipment Review	[TBP]%	$[TBP]	$[TBP]
11	[TBP]	Mission Rehearsals Complete	[TBP]%	$[TBP]	$[TBP]
12	[TBP]	Launch and Early on Orbit Operations	[TBP]%	$[TBP]	$[TBP]
13	[TBP]	FM-1 Commissioning and Final On-Orbit Acceptance	[TBP]%	$[TBP]	$[TBP]

ATP = Authorization To Proceed
TBP = To Be Proposed

Table 1.3 Performance Based Payment Schedule for CLIN 003 Pre-Priced Change (PPC) Options

Event No.	Payment Event – Pre-Priced Change (PPC) Option
14	PPC Option 1 (PPC 1): Observatory Delivery Delay*
15	PPC Option 2 (PPC 2): Observatory Environmental Testing Support Delay*
16	PPC Option 3 (PPC 3): Launch Delay, Observatory Storage, and Post-Storage Testing*
17	PPC Option 4 (PPC 4): Extended Launch Delay, Observatory Storage, and Post-Storage Testing*

*Monthly incremental payments

Table 2.1 Performance Based Payment Event Closure Criteria for CLIN 001 Flight Instrument

Event No.	Milestone Payment Event	Description of Event Completion Criteria
1	Kickoff Meeting	The COR provides notice that the below criteria have been met: 1. The Contractor provides and presents key engineering materials (block diagram, MEL, parts lists, catalog change summary, performance margins summary). 2. The Contractor provides and presents an initial IMS. 3. The contractor identifies key risk areas and with mitigation. 4. The contractor provides a subcontracting plan and identifies long lead procurement. 5. Kickoff Meeting complete upon satisfactory closeout of RFAs assigned to the contractor.
2	System Requirements Review (SRR)	The COR provides notice that the below criteria have been met: 1. All Contract Data Requirements List (CDRL) deliverables for which delivery is required prior to this milestone have been delivered and the requirements of the Data Item Descriptions (DID) have been met, and the Contracting Officer has approved those data items requiring Government approval. 2. The Contractor has met all requirements of the review in accordance with the Statement of Work (SOW) Section 4.5.4.1 and demonstrated to the satisfaction of the Government a complete and thorough understanding of the spacecraft requirements necessary to progress into the next phase of the effort. In addition, any critical action items* generated as a result of this review have been completed to the satisfaction of the Government. 3. Prior to the review, the Contractor highlighted and discussed with the Government any significant risk areas (e.g., problematic requirements, critical technology dependencies, outstanding trade studies, or significant resource constraints). 6. The system design builds upon the initial concept by providing a complete definition of the interfaces and key higher-level performance and technical requirements, which have been appropriately flowed to the systems and/or subsystems. 7. A baseline risk management approach including risk identification and mitigation strategy is defined and approved and has been implemented by the Contractor for this spacecraft delivery order. The Contractor identified major risks and viable mitigation strategies are defined. 8. All previous milestones have been met and payment has been approved by the Contracting Officer. * A “critical action item” is defined as an action item of a technical nature that, unless resolved prior to review closeout, appreciably increases the risk to hardware, software, safety, or to the scheduled instrument delivery (shipment) as specified in the delivery order. “Completed” means that the Contractor has provided a response that has been accepted by the Government.

3	Preliminary Design Review (PDR)	The COR provides notice that the below criteria have been met: 1. All Contract Data Requirements List (CDRL) deliverables for which delivery is required prior to this milestone have been delivered and the requirements of the Data Item Descriptions (DID) have been met, and the Contracting Officer has approved those data items requiring Government approval. 2. The Contractor has met all requirements of the review in accordance with the Statement of Work (SOW) Section 4.5.4.2 and demonstrated to the satisfaction of the Government a complete and thorough understanding of the spacecraft requirements necessary to progress into the next phase of the effort. In addition, any critical action items* generated as a result of this review have been completed to the satisfaction of the Government. 3. Prior to the review, the Contractor highlighted and discussed with the Government any significant risk areas (e.g., problematic requirements, critical technology dependencies, outstanding trade studies, or significant resource constraints). 4. The system design builds upon the initial concept by providing a complete definition of the interfaces and key higher-level performance and technical requirements, which have been appropriately flowed to the systems and/or subsystems. 5. A baseline risk management approach including risk identification and mitigation strategy is defined and approved and has been implemented by the Contractor for this spacecraft delivery order. The Contractor identified major risks and viable mitigation strategies are defined. 6. All previous milestones have been met and payment has been approved by the Contracting Officer. * A "critical action item" is defined as an action item of a technical nature that, unless resolved prior to review closeout, appreciably increases the risk to hardware, software, safety, or to the scheduled instrument delivery (shipment) as specified in the delivery order. "Completed" means that the Contractor has provided a response that has been accepted by the Government.
4	Engineering Development Unit (EDU) Complete	The COR provides notice that the EDU design, build, and test is complete.
5	Critical Design Review (CDR)	The COR provides notice that the below criteria have been met: 1. All CDRL data deliverables for which delivery is required prior to this milestone have been delivered and the requirements of the DID have been met, and the Contracting Officer has approved those data items requiring Government approval. 2. The Contractor has met all requirements of the review in accordance with the SOW Section 4.5.4.3, and demonstrated to the satisfaction of the Government, a complete and thorough understanding of the spacecraft design and requirements necessary to progress into the next phase of the effort. In addition, any critical action items* generated as a result of this review have been completed to the satisfaction of the Government. 3. The Contractor's critical designs of all components and subsystems meet the requirements of the contract for a Critical Design Review.

5 (cont'd)	CDR (cont'd)	4. Planning and presentation of information at major element milestone reviews have been rigorous; peer review results have been included in review briefings; review success criteria have been adequately met; closeout of all review actions has been timely and thorough. 5. A comprehensive set of Engineering Peer Reviews has been conducted on appropriate hardware and software elements. The Engineering Peer Review results and actions have been documented and communicated to the Government. Additional peer reviews have been identified as necessary and appropriately planned. Requirements changes since the PDR and associated rationale have been properly documented. Planned physical and analytic integration activities for all hardware and software elements of the system, including ground equipment are complete. Planned test activities have been documented, including validation, calibration, and operations compatibility testing, as applicable. Plans and procedures to assess discrepancies and confirm adequate closeout precede each integration step. 6. Plans for verification and validation activities (analysis, inspection, and test) associated with software and hardware elements at all levels of assembly are complete. The trending analyses for key parameters have been defined. Total and failure-free run time requirements of primary and redundant elements have been defined and deemed adequate. 7. Estimates of critical resource margins (i.e., mass, power, volume, Computer Processor Unit (CPU) throughput and memory, etc.) have been delineated based on design maturity. Sufficient margins exist based on applicable standards. Viable risk mitigation strategies have been defined where margins fall below applicable guidelines or best practices. 8. Up-to-date risk assessments with suitably defined mitigation strategies are available. All significant risks, problems, and open items are identified and tracked (including development and flight performance related items). Risk mitigation plans are appropriate and credible. Risks associated with I&T have been characterized and mitigations are on track for timely closure. 9. Interface Control Documents (ICDs) with the spacecraft, as well as between system elements, are completed and approved. All to be determined (TBDs) and to be reviewed (TBRs) are resolved or identified on the risk list with acceptable rationale, plans, and schedules existing for their disposition. 10. System performance estimates indicate a design expected to meet the requirements within the resource allocation. Operational limits and constraints are well defined. The overall systems design is producible. 11. Complete and comprehensive definitions of the system design from the box and critical component level have been finalized. Materials presented on the primary subsystems (e.g., electrical, power, structures, Command and Data Handling, software, optics, thermal, ground processing algorithm, etc.) are sufficiently mature and provide demonstrated evidence of an acceptable design solution. 12. Trade studies are complete and properly documented including analyses and the rationale for the selected alternatives. Any open trade studies are identified and with acceptable risk mitigation. 13. Design changes since the SRR have been appropriately documented with suitable rationale provided and systems impacts identified and assessed. 14. Design modeling and analyses are complete with proper consideration of the documented results (e.g., performance, reliability, etc.) in the final mission design.

5 (cont'd)	CDR (cont'd)	15. Analyses of mechanical loads, stress, fracture control, and torque margins have been completed. 16. Contamination analyses are finalized. 17. Build-to specifications for all hardware and software configuration items are complete. 18. Technical data information (e.g., integrated schematics, spares provisioning list, interface control documents, engineering analyses, and specifications) are complete. 19. All analyses critical to proof of design are complete with any outstanding analyses having acceptable completion dates. Any potential impacts are understood and can be accommodated. 20. There are no proposals due from the contractor which have exceeded the time periods in Section I, Clause 1852.216-80. 21. There are no undefinitized contract actions regarding work necessary to complete this phase of the effort. 22. All previous milestones have been met and payment has been approved by the Contracting Officer. * A "critical action item" is defined as an action item of a technical nature that, unless resolved prior to review closeout, appreciably increases the risk to hardware, software, safety, or to the scheduled instrument delivery (shipment) as specified in the delivery order. "Completed" means that the Contractor has provided a response that has been accepted by the Government.
6	Pre- Environmental Review (PER)	The COR provides notice that the below criteria have been met: 1. All CDRL deliverables for which delivery is required prior to this milestone have been delivered and the requirements of the DID RVW-1 have been met, and the Contracting Officer has approved those data items requiring Government approval. 2. The Contractor has met all requirements of the review in accordance with the SOW Section 4.5.4.4, and demonstrated to the satisfaction of the Government, a complete and thorough understanding of the spacecraft requirements necessary to progress into the next phase of the effort. In addition, any critical action items* generated as a result of this review have been completed to the satisfaction of the Government. 3. The instrument and all components and subsystems meet the entry requirements of the contract for the System Integration Review and the Pre-Environmental Review. 4. There are no proposals due from the contractor which have exceeded the time periods in Section I, Clause 1852.216-80 5. There are no undefinitized contract actions regarding work necessary to complete this phase of the effort. 6. All previous milestones have been met and payment has been approved by the Contracting Officer. * A "critical action item" is defined as an action item of a technical nature that, unless resolved prior to review closeout, appreciably increases the risk to hardware, software, safety, or to the scheduled instrument delivery (shipment) as specified in the delivery order. "Completed" means that the Contractor has provided a response that has been accepted by the Government.

7	FM-1 Pre-Shipment Review (PSR)	The COR provides notice that the below criteria have been met: 1. All CDRL deliverables for which delivery is required prior to this milestone have been delivered and the requirements of the DID RVW-1 have been met, and the Contracting Officer has approved those data items requiring Government approval. 2. The Contractor has met all requirements of the review in accordance with the SOW Section 4.5.4.5, and verified to the satisfaction of the Government the instrument's performance via the completed verification program. In addition, any critical action items* generated as a result of this review have been completed to the satisfaction of the Government. 3. There are no proposals due from the contractor which have exceeded the time periods in Section I, Clause 1852.216-80. 4. There are no undefinitized contract actions regarding work necessary to complete this phase of the effort. 5. All previous milestones have been met and payment has been approved by the Contracting Officer. * A "critical action item" is defined as an action item of a technical nature that, unless resolved prior to review closeout, appreciably increases the risk to hardware, software, safety, or to the scheduled instrument delivery (shipment) as specified in the delivery order. "Completed" means that the Contractor has provided a response that has been accepted by the Government.
8	FM-2 Delivery	The COR provides notice that the FM-2 has been delivered to the government as required and meets requirements.

Table 2.2 Performance Based Payment Event Closure Criteria for CLIN 002 Flight Instrument

9	Observatory Pre-Storage Review	The COR provides notice that the below criteria have been met: 1. The Contractor supported all Observatory level Environmental Testing to ensure XRIS performance and health. 2. The Contractor presented Pre-Storage Review information regarding XRIS at the Observatory Pre-Storage review.
10	Observatory Pre-Shipment Review	The COR provides notice that the below criteria have been met: 1. The Contractor supported all post-storage Observatory testing to ensure XRIS performance and health. 2. The Contractor presented Pre-Shipment Review information regarding XRIS at the Observatory Pre-Storage review.
11	Mission Rehearsals Complete	The COR provides notice that the Contractor supported all mission rehearsals prior to launch.
12	Launch and Early on Orbit Operations	The COR provides notice that the Contractor supported launch and Early on Orbit Operations
13	FM-1 Commissioning and Final On-Orbit Acceptance	The COR provides notice that: 1. The Contractor has met all requirements in accordance with the SOW and supported the Observatory Post Launch Acceptance Review (PLAR). 2. The Contractor has demonstrated on- orbit acceptance of the instrument, using on-orbit test data and supporting analyses, to validate and verify instrument health, performance, and functionality. Specifically, this shall include demonstration of successful and complete activation and calibration, deployment of all appendages, and demonstration of specification compliance. 3. All Anomaly Reports (ARs), Problem Failure Reports (PFRs), malfunction reports, deviations, waivers, and open items have been satisfactorily dispositioned. 4. In-flight anomalies and the responsive actions taken, including any autonomous fault protection actions taken by the instrument or any unexplained instrument telemetry, including alarms, are documented and their impact on operations assessed. 5. All CDRL data item and Mission Assurance Requirements (MAR) deliverables have been delivered and the requirements of the DRDs and DIDs have been met, and the Contracting Officer has accepted all deliverables. 6. The Contractor has provided all support as required per SOW 9.1.5. 7. The need for changes to procedures, interface agreements, software, and staffing has been documented. 8. The Contractor has all remaining critical action items completed and open items, if any, regarding instrument operations identified have been satisfactorily disposed. 9. Documentation is updated, including any updates originating from the early operations experience. 10. The observed Spacecraft and science payload accommodation or interface

		performance agrees with prediction or, if not, is adequately understood so that future behavior can be predicted with confidence. 11. All previous milestones have been met and payment has been approved by the Contracting Officer. * A "critical action item" is defined as an action item of a technical nature that, unless resolved prior to review closeout, appreciably increases the risk to hardware, software, safety, or to the scheduled observatory delivery (shipment) as specified in the delivery order. "Completed" means that the Contractor has provided a response that has been accepted by the Government.

Table 2.3 Performance Based Payment Event Closure Criteria for CLIN 003 Pre-Priced Change (PPC) Options "As Exercised":

Event No.	PPC Option	Description of Event Completion Criteria
14	PPC 1: Observatory Delivery Delay	1. All Contract Data Requirements List (CDRL) data items for which delivery is required prior to this milestone have been delivered, the requirements have been met as determined by the Government, and the Contracting Officer has approved those data items requiring Government approval. 2. The Contractor has met all requirements of instrument support in accordance with SOW 10.1.1and the completion criteria defined in the SOW 10.1.1 and verified to the satisfaction of the Government. 3. All previous milestones have been met and the Contracting Officer has approved payment.
15	PPC 2: Observatory Environmental Testing Support Delay	1. All Contract Data Requirements List (CDRL) data items for which delivery is required prior to this milestone have been delivered, the requirements have been met as determined by the Government, and the Contracting Officer has approved those data items requiring Government approval. 2. The Contractor has met all requirements of spacecraft support in accordance with SOW 10.1.2 and the completion criteria defined in the SOW 10.1.2, and verified to the satisfaction of the Government. 3. All previous milestones have been met and the Contracting Officer has approved payment.
16	PPC 3: Launch Delay, Observatory Storage, and Post-Storage Testing	1. All Contract Data Requirements List (CDRL) data items for which delivery is required prior to this milestone have been delivered, the requirements have been met as determined by the Government, and the Contracting Officer has approved those data items requiring Government approval. 2. The Contractor has met all requirements of instrument support in accordance with SOW 10.1.3 and the completion criteria defined in the SOW 10.1.3 and verified to the satisfaction of the Government. 3. All previous milestones have been met and the Contracting Officer has approved payment.
17	PPC 4: Extended Launch Delay, Observatory Storage, and Post-Storage Testing	1. All Contract Data Requirements List (CDRL) data items for which delivery is required prior to this milestone have been delivered, the requirements have been met as determined by the Government, and the Contracting Officer has approved those data items requiring Government approval. 2. The Contractor has met all requirements of instrument support in accordance with 10.1.4 and the completion criteria defined in the SOW 10.1.4 and verified to the satisfaction of the Government. 3. All previous milestones have been met and the Contracting Officer has approved payment.