

**SPACE ACT AGREEMENT AMENDMENT TWO  
BETWEEN  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AND  
SPACE EXPLORATION TECHNOLOGIES CORPORATION  
FOR  
COMMERCIAL ORBITAL TRANSPORT SERVICES DEMONSTRATION (COTS)**

**PURPOSE AND AGENCY COMMITMENT**

This Amendment Two modifies the terms and conditions of NNJ06TA26S including Amendment One, for the following Articles:

APPENDIX 2: SpaceX Milestones and Success Criteria

All Pages as shown

APPENDIX 3: Success Criteria for COTS Milestone Reviews

All Pages as shown

APPENDIX 2 and APPENDIX 3 with Modifications incorporated are as follows:

APPENDIX 2: SpaceX Milestones and Success Criteria

**Capabilities A-C – Cargo Demonstrations**

<p><b>Milestone 1: Project Management Plan Review</b></p> <p>Subsequent to Space Act Agreement execution and initiation of the COTS program, SpaceX shall host a kickoff meeting to describe the plan for program implementation, which includes management planning for Design, Development, Testing, &amp; Evaluation (DDT&amp;E), integrated schedule, financing, supplier engagement, risks and anticipated mitigations.</p> <p>SpaceX shall provide a briefing of the program implementation plan, along with a hard copy of the presentation materials, and responses to any questions that the NASA Team might have concerning SpaceX's plan.</p> <p>Acceptance within 5 days and payment within 15 days</p> <p>Success Criteria: Successful completion of the project management plan review as described above.</p>	<p>Amount: \$23,133,333 Date: Sept. 2006</p>
<p><b>Milestone 2: Demo 1 System Requirements Review</b></p> <p>SpaceX shall conduct a Demonstration 1 System Requirements Review in accordance with the SRR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the SRR.</p>	<p>Amount \$5,000,000 Date: Nov. 2006</p>
<p><b>Milestone 3: Demo 1 Preliminary Design Review (PDR)</b></p> <p>SpaceX shall conduct a PDR in accordance with the PDR definition in Appendix 3</p> <p>Success Criteria: Successful completion of the PDR.</p>	<p>Amount: \$18,133,333 Date: February 2007</p>
<p><b>Milestone 4: Financing Round 1</b></p> <p>[REDACTED]</p> <p>[REDACTED]</p>	<p>Amount: \$10,000,000 Date: March 2007</p>

<p><b>Milestone 5: Demo 2 System Requirements Review</b></p> <p>SpaceX shall conduct a Demonstration 2 System Requirements Review in accordance with the SRR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the SRR.</p>	<p>Amount \$31,133,333 Date: March 2007</p>
<p><b>Milestone 6: Demo 1 System Critical Design Review</b></p> <p>SpaceX shall conduct a System Critical Design Review (CDR) in accordance with accordance with the CDR definition in Appendix 3. SpaceX shall also provide review of the FAA Licensing Package.</p> <p>Success Criteria: Successful completion of the System CDR and draft of the FAA Licensing Package.</p>	<p>Amount \$8,133,333 Date: Aug. 2007</p>
<p><b>Milestone 7: Demo 3 System Requirements Review</b></p> <p>SpaceX shall conduct a Demonstration 3 System Requirements Review in accordance with the SRR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the SRR.</p>	<p>Amount \$22,333,333 Date: October, 2007</p>
<p><b>Milestone 8: Demo 2 Preliminary Design Review</b></p> <p>SpaceX shall conduct a Preliminary Design Review (PDR) in accordance with the PDR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the PDR.</p>	<p>Amount \$21,133,333 Date: December, 2007</p>

<p><b>Milestone 9: Draco Initial Hot-Fire</b></p> <p>SpaceX shall conduct a nominal hot-fire test of a prototype Draco thruster.</p> <p>Entrance Criteria:</p> <ul style="list-style-type: none"> <li>- Draco prototype assembled and ready for test</li> <li>- Draco Test facility certified and ready to support test</li> <li>- Test Procedure reviewed and released</li> <li>- Acceptable ranges for key performance parameters defined for test</li> <li>- Data acquisition system tested and ready to support</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>- Nominal burn of at least 5 seconds duration</li> <li>- Test data recorded and archived</li> <li>- Preliminary Test Report showing key parameters within expected ranges as defined prior to test.</li> </ul>	<p>Amount \$6,000,000 Date: March 2008</p>
<p><b>Milestone 10: Financing 2</b></p> <p>[REDACTED]</p> <p>[REDACTED]</p>	<p>Amount: \$10,000,000 Date: March 2008</p>
<p><b>Milestone 11: Demo 3 Preliminary Design Review</b></p> <p>SpaceX shall conduct a Preliminary Design Review (PDR) in accordance with the PDR definition in Appendix 3.</p> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>- Successful completion of the PDR per Appendix 3 criteria</li> <li>- Explanation of SpaceX plans for PCBM fabrication and verification prior to flight, including identification of associated schedule and risks.</li> </ul>	<p>Amount: \$22,000,000 Date: June 2008</p>

<p><b>Milestone 12: Multi-engine Test</b></p> <p>SpaceX shall conduct a nominal hot-fire test with nine M9 engines.</p> <p>Entrance Criteria:</p> <ul style="list-style-type: none"> <li>- Nine M9 engines installed on large test stand and ready for nine-engine test</li> <li>- Large test stand certified and ready to support nine engine test</li> <li>- Test Procedure reviewed and released</li> <li>- Acceptable ranges for key performance parameters defined</li> <li>- Data acquisition system tested and ready to support test</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>- Nominal ignition and shut-down of all nine M9 engines</li> <li>- At least 15 seconds of nominal burn on all nine engines</li> <li>- Test data recorded and archived</li> <li>- Preliminary Test Report showing key parameters within expected ranges as defined prior to test</li> </ul>	<p>Amount \$22,000,000 Date: September 2008</p>
<p><b>Milestone 13: Demo 2/3 System Critical Design Review</b></p> <p>SpaceX shall conduct a System Critical Design Review (CDR) for Demo Missions C2 and C3 in accordance with the CDR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the CDR and production of draft of the related FAA Licensing Package.</p>	<p>Amount \$25,000,000 Date: December 2008</p>
<p><b>Milestone 14: Financing 3</b></p> <p>[REDACTED]</p> <p>[REDACTED]</p>	<p>Amount \$10,000,000 Date: March 2009</p>
<p><b>Milestone 15: Demo 1 Readiness Review (DRR)</b></p> <p>SpaceX shall conduct a Demo 1 Readiness Review in accordance with the DRR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the DRR.</p>	<p>Amount \$5,000,000 Date: March 2009</p>

<p><b>Milestone 16: CUCU Flight Unit Design, Acceptance, and Delivery</b></p> <p>SpaceX shall provide a CUCU ISS Flight Unit and Flight Spare to NASA for ISS mission integration.</p> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>- Successful completion of SpaceX acceptance testing on ISS flight unit and flight spare</li> <li>- Physical delivery of a CUCU flight unit and flight spare to NASA</li> <li>- Delivery of acceptance test results, as-built configuration and schematics to NASA</li> </ul>	<p>Amount: \$9,000,000 Date: May 2009</p>
<p><b>Milestone 17: Demo 1 Mission</b></p> <p>SpaceX shall launch the Demonstration 1 mission and complete a post-flight review.</p> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>- Perform integration and launch</li> <li>- Complete a post-flight quick-look review (approx. 2 days after mission completion) assessing performance against objectives</li> <li>- Identify any anomalies with preliminary assessment of cause</li> </ul>	<p>Amount \$5,000,000 Date: June 2009</p>
<p><b>Milestone 18: Demo 2 Readiness Review</b></p> <p>SpaceX shall conduct a Demo 2 Demonstration Readiness Review in accordance with the DRR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the DRR.</p>	<p>Amount \$5,000,000 Date: September 2009</p>
<p><b>Milestone 19: Demo 2 Mission</b></p> <p>SpaceX shall launch the Demonstration 2 mission and complete a post-flight review.</p> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>- Perform integration and launch</li> <li>- Complete post-flight quick-look review (approx. 2 days after mission completion) assessing performance against objectives</li> <li>- Identify any anomalies with preliminary assessment of cause</li> </ul>	<p>Amount \$5,000,000 Date: November 2009</p>

<p><b>Milestone 20: Cargo Integration Demonstration</b></p> <p>SpaceX shall conduct a cargo demonstration using a sample manifest of cargo simulators. The demonstration shall include physical stowage of cargo simulators in Dragon and Trunk, provision of power and data to cargo where required, and verification of stowage procedures.</p> <p>Success Criteria: Successful completion of Cargo Demonstration</p>	<p>Amount \$5,000,000 Date: January 2010</p>
<p><b>Milestone 21: Demo 3 Readiness Review</b></p> <p>SpaceX shall conduct a Demo 3 Demonstration Readiness Review in accordance with the DRR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the DRR.</p>	<p>Amount \$5,000,000 Date: January 2010</p>
<p><b>Milestone 22: Demo 3 Mission</b></p> <p>SpaceX shall launch the Demonstration 3 mission and complete a post-flight review.</p> <p>Entrance Criteria:</p> <ul style="list-style-type: none"> <li>- Primary objectives for the demonstration have been defined by SpaceX with NASA concurrence</li> </ul> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>- Perform integration and launch</li> <li>- Primary objectives have been met</li> <li>- Complete the post-flight quick-look review (approx. 2 days after mission completion) assessing performance against objectives</li> <li>- Identify any anomalies with preliminary assessment of cause</li> </ul>	<p>Amount \$5,000,000 Date: March 2010</p>

## Capability D - Crew Transportation Demonstrations

### **Milestone D1: Project Management Plan Review & Crew Demo 1 System Requirements Review**

Subsequent to Space Act Agreement execution and initiation of the COTS program, SpaceX shall host a kickoff meeting to describe the plan for program implementation, which includes management planning for Design, Development, Testing, & Evaluation (DDT&E), integrated schedule, financing, supplier engagement, risks and anticipated mitigations.

SpaceX shall provide a briefing of the program implementation plan, along with a hard copy of the presentation materials, and responses to any questions that the NASA Team might have concerning SpaceX's plan.

SpaceX shall conduct a Crew Demonstration 1 System Requirements Review in accordance with the SRR definition in Appendix 3.

**Success Criteria:**

Successful completion of the Project Management plan review. Successful completion of the SRR.

Amount: \$27,420,000  
Date: Dec. 2009

### **Milestone D2: Financing D1**

[REDACTED]

[REDACTED]

Amount: \$10,000,000  
Date: March 2010

### **Milestone D3: Crew Demo 1 System Preliminary Design Review**

SpaceX shall conduct a Preliminary Design Review (PDR) in accordance with the PDR definition in Appendix 3.

**Success Criteria:**

Successful completion of the PDR.

Amount: \$22,420,000  
Date: April 2010

<p><b>Milestone D4: Crew Demo 2 System Requirements Review</b></p> <p>SpaceX shall conduct a Crew Demonstration 2 System Requirements Review in accordance with the SRR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the SRR.</p>	<p>Amount: \$25,420,000 Date: June 2010</p>
<p><b>Milestone D5: Crew Demo 1 Critical Design Review</b></p> <p>SpaceX shall conduct a System Critical Design Review (CDR) in accordance with the CDR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the CDR and production of draft of the FAA Licensing Package.</p>	<p>Amount: \$20,420,000 Date: August 2010</p>
<p><b>Milestone D6: Crew Demo 2 System Preliminary Design Review</b></p> <p>SpaceX shall conduct a Preliminary Design Review (PDR) in accordance with the SRR definition in accordance with the PDR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the PDR.</p>	<p>Amount: \$20,420,000 Date: Oct. 2010</p>
<p><b>Milestone D7: Crew Demo 1 Demonstration Readiness Review</b></p> <p>SpaceX shall conduct a Demo 1 Readiness Review in accordance with the DRR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the DRR.</p>	<p>Amount \$20,420,000 Date: Dec. 2010</p>
<p><b>Milestone D8: Crew Demo 3 System Requirements Review</b></p> <p>SpaceX shall conduct a Crew Demonstration 3 System Requirements Review in accordance with the SRR definition Appendix 3.</p> <p>Success Criteria: Successful completion of the Crew Demo 3 SRR.</p>	<p>Amount: \$25,420,000 Date: Feb. 2011</p>

<p><b>Milestone D9: Financing 2D</b></p> <p>[REDACTED]</p> <p>[REDACTED]</p>	<p>Amount: \$10,000,000 Date: March 2011</p>
<p><b>Milestone D10: Crew Demo 2 Critical Design Review</b></p> <p>SpaceX shall conduct a System Critical Design Review (CDR) in accordance with the CDR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the CDR and production of draft of the FAA Licensing Package.</p>	<p>Amount: \$18,420,000 Date: March 2011</p>
<p><b>Milestone D11: Crew Demo 3 System Preliminary Design Review</b></p> <p>The SpaceX shall conduct a Preliminary Design Review (PDR) in accordance with the PDR definition in Appendix 3.</p> <p>str</p> <p>Success Criteria: Successful completion of the PDR.</p>	<p>Amount: \$20,420,000 Date: May 2011</p>
<p><b>Milestone D12: Crew Demo 1 Mission</b></p> <p>SpaceX shall perform a Launch Readiness Review, launch, and complete a post demonstration report.</p> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>- Perform integration and launch</li> <li>- Complete post-flight quick-look review (approx. 2 days after mission completion) assessing performance against objectives</li> <li>- Identify any anomalies with preliminary assessment of cause</li> </ul>	<p>Amount \$15,420,000 Date: June 2011</p>
<p><b>Milestone D13: Crew Demo 2 Demonstration Readiness Review</b></p> <p>SpaceX shall conduct a Demo 2 Demonstration Readiness Review in accordance with the DRR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the DRR.</p>	<p>Amount \$18,420,000 Date: July 2011</p>

<p><b>Milestone D14: Crew Demo 3 Critical Design Review</b></p> <p>SpaceX shall conduct a System Critical Design Review (CDR) in accordance with the CDR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the CDR and production of draft of the FAA Licensing Package.</p>	<p>Amount: \$18,420,000 Date: Sept., 2011</p>
<p><b>Milestone D15: Crew Demo 2 Mission</b></p> <p>SpaceX shall perform a Launch Readiness Review, launch and complete a post demonstration report.</p> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>- Perform integration and launch</li> <li>- Complete post-flight quick-look review (approx. 2 days after mission completion) assessing performance against objectives</li> <li>- Identify any anomalies with preliminary assessment of cause</li> </ul>	<p>Amount \$8,420,000 Date: December 2011</p>
<p><b>Milestone D16: Crew Demo 3 Demonstration Readiness Review</b></p> <p>SpaceX shall conduct a Demo 2 Demonstration Readiness Review in accordance with the DRR definition in Appendix 3.</p> <p>Success Criteria: Successful completion of the DRR.</p>	<p>Amount \$18,420,000 Date: Jan. 2012</p>
<p><b>Milestone D17: Crew Demo 3 Mission</b></p> <p>SpaceX shall perform a Launch Readiness Review, launch and complete a post demonstration report.</p> <p>Success Criteria:</p> <ul style="list-style-type: none"> <li>- Perform integration and launch</li> <li>- Primary objectives have been met</li> <li>- Complete post-flight quick-look review (approx. 2 days after mission completion) assessing performance against objectives</li> <li>- Identify any anomalies with preliminary assessment of cause</li> </ul>	<p>Amount \$8,420,000 Date: April 2012</p>

APPENDIX 3: Success Criteria for COTS Milestone Reviews

## Appendix 3 Success Criteria for COTS Milestone Reviews

### G.2 System Requirements Review (SRR)

- a. The SRR examines the functional and performance requirements defined for the system and the preliminary program or project plan to ensure that the requirements and the selected concept will satisfy the mission.
- b. [Reserved]
- c. **Entrance Criteria.** Prior to the execution of the SRR, the activities and products identified in Table G-2, below, should be completed and documentation provided to all participants seven (7) calendar days prior to the review.
- d. **Success Criteria.** The review board concludes that the success criteria in Table G-2 was accomplished to complete the objectives of the SRR.

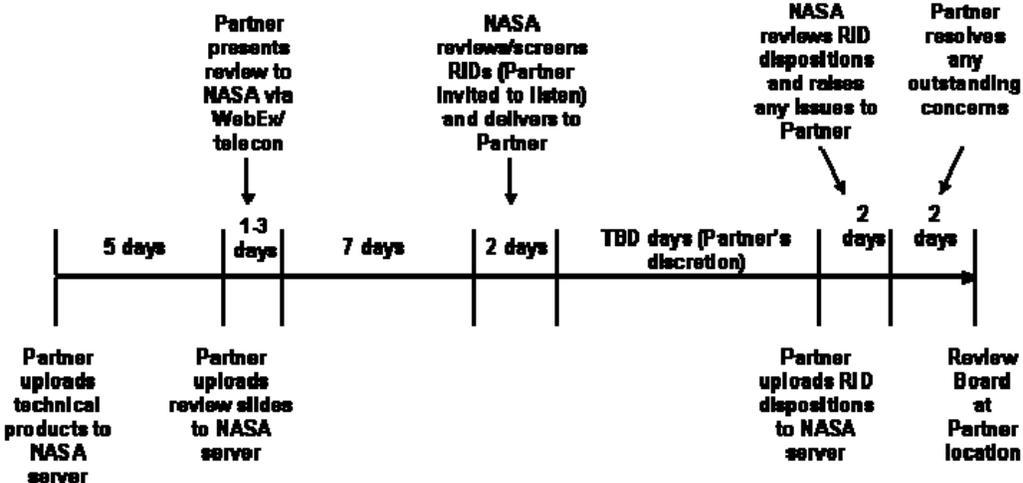
**Table G-2 – SRR Entrance and Success Criteria**

<b>System Requirements Review and/or Mission Definition Review</b>	
<b>Entrance Criteria</b>	<b>Success Criteria</b>
<ul style="list-style-type: none"> <li>1. A preliminary SRR agenda, success criteria, and charge to the board have been agreed to by the technical team, project manager, and review chair prior to the SRR.</li> <li>2. The following technical products for hardware and software system elements are available to the cognizant participants prior to the review:                             <ul style="list-style-type: none"> <li>a. System Architecture.</li> <li>b. System requirements document.</li> <li>c. System software functionality description.</li> <li>d. Updated concept of operations.</li> <li>e. Preliminary system requirements allocation to the next lower level system.</li> <li>f. List of major trades.</li> <li>g. Updated risk assessment and mitigations.</li> <li>h. Updated schedule data.</li> <li>i. Preliminary human rating plan.</li> <li>j. Preliminary software development plan.</li> <li>k. Preliminary system safety and mission assurance plan.</li> <li>l. Configuration management plan.</li> <li>m. Initial document tree.</li> <li>n. Preliminary system safety &amp; mission assurance plan.</li> <li>o. Preliminary verification and validation approach.</li> <li>p. Preliminary hazard analysis outline.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>1. The resulting overall concept is reasonable, feasible, complete, responsive to the mission requirements, and is consistent with system requirements and available resources (cost, schedule, mass power, etc.).</li> <li>2. The project utilizes a sound process for the allocation and control of requirements throughout all levels, and a plan has been defined to complete the definition activity within schedule constraints.</li> <li>3. Requirements definition is complete with respect to top level mission and science requirements, and interfaces with external entities and between major internal elements have been defined.</li> <li>4. Requirements allocation and flow down of key driving requirements have been defined down to subsystems.</li> <li>5. System and subsystem design approaches and operational concepts exist and are consistent with the requirements set.</li> <li>6. The requirements, design approaches, and conceptual design will fulfill the mission needs within the estimated costs.</li> <li>7. Preliminary approaches have been determined for how requirements will be</li> </ul>

	verified and validated down to the subsystem level 8. Major risks have been identified, and viable mitigation strategies have been defined.
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**G.4 Preliminary Design Review (PDR)**

- a. The Preliminary Design Review (PDR) demonstrates that the preliminary design meets all system requirements with acceptable risk and within the cost and schedule constraints and establishes the basis for proceeding with detailed design. It will show that the correct design option has been selected, interfaces have been identified, and verification methods have been described.
- b. PDR occurs near the completion of the preliminary design phase.
- c. **Entrance Criteria.** Prior to the execution of the PDR, the activities and products identified in Table G-4 should be completed and documentation provided to all participants according to the Design Review Timeline below. Also, precursor reviews should be completed.



**Design Review Timeline**

- d. **Success Criteria.** The review board concludes that the success criteria in Table G-4 was accomplished to complete the objectives of the PDR.

**Table G-4 – PDR Entrance and Success Criteria**

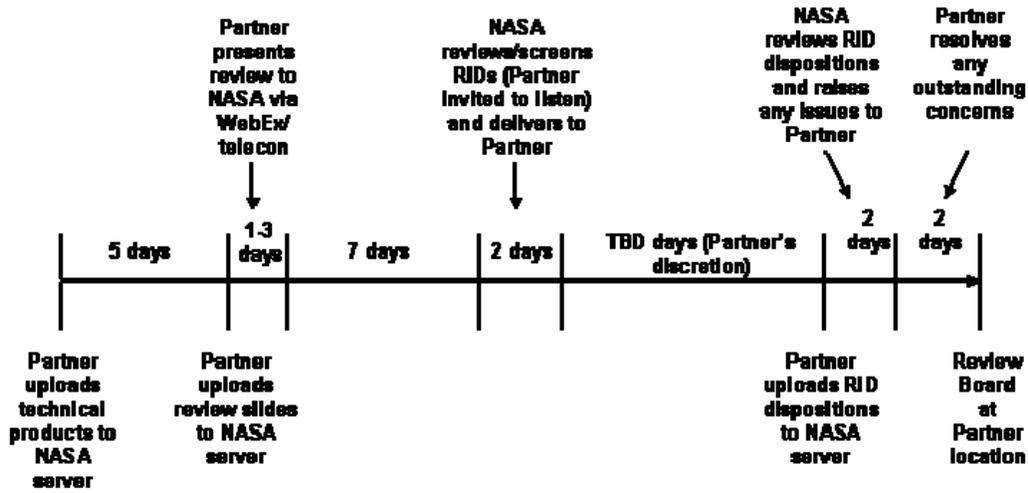
Preliminary Design Review	
Entrance Criteria	Success Criteria
1. A preliminary PDR agenda, success criteria, and charge to the board have been agreed to by the technical team, project manager, and review chair prior to the PDR. 2. PDR technical products listed below for both hardware and software system elements have been made available to the cognizant participants prior to the review: <ul style="list-style-type: none"> <li>a. Updated baselined documentation, as required.</li> <li>b. Preliminary subsystem design specifications for each configuration item (hardware and software), with supporting tradeoff analyses and data, as required. The</li> </ul>	1. Agreement exists for the top-level requirements, including mission success criteria, Technical Performance Measures (TPMs), and any sponsor-imposed constraints, and that these are finalized, stated clearly, and are consistent with the preliminary design. 2. The flow down of verifiable requirements is complete and proper or, if not, an adequate plan exists for timely resolution

<p>preliminary software design specification needs to include a completed definition of the software architecture and a preliminary database design description as applicable.</p> <ul style="list-style-type: none"> <li>c. Updated risk assessment and mitigation.</li> <li>d. Updated schedule data.</li> <li>e. Preliminary logistics plan.</li> <li>f. Applicable technical plans (e.g., technical performance measurement plan, contamination control plan, parts management plan, environments control plan, EMI/EMC control plan, quality assurance plan, etc.).</li> <li>g. Applicable standards.</li> <li>h. Preliminary safety analyses and plans.</li> <li>i. Engineering drawing tree.</li> <li>j. Interface control documents.</li> <li>k. Verification/validation plan.</li> <li>l. Plans to respond to regulatory requirements (e.g., Environmental Impact Statement), as required.</li> <li>m. System-level hazard analysis.</li> <li>n. Preliminary limited life items list (LLIL).</li> </ul>	<p>of open items. Requirements are traceable to mission goals and objectives.</p> <ul style="list-style-type: none"> <li>3. The preliminary design is expected to meet the requirements at an acceptable level of risk.</li> <li>4. Definition of the technical interfaces is consistent with the overall technical maturity and proves an acceptable level of risk.</li> <li>5. Adequate technical interfaces are consistent with the overall technical maturity and provide an acceptable level of risk.</li> <li>6. Adequate technical margins exist with respect to technical performances measures (TPMs).</li> <li>7. The project risks are understood, and plans and a process and resources exist to effectively manage them.</li> <li>8. Safety and mission assurance (i.e., safety, reliability, maintainability, quality, and EEE parts) have been adequately addressed in preliminary designs and any applicable preliminary S&amp;MA products (i.e., hazard analysis and failure modes and effects analysis) have been approved.</li> <li>9. The operational concept is technically sound, that it includes (where appropriate) human factors that apply, and that requirements for its execution flow down.</li> </ul>
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## G.5 Critical Design Review (CDR)

- a. The purpose of the CDR is to demonstrate that the maturity of the design is appropriate to support proceeding with full scale fabrication, assembly, integration, and test, and that the technical effort is on track to complete the flight and ground system development and mission operations in order to meet mission performance requirements within the identified cost and schedule constraints.
- b. CDR occurs near the completion of the final design phase and generally before entering the fabrication, assembly, and qualification phase.
- c. **Entrance Criteria.** Prior to the execution of the CDR, the activities and products identified in Table G-5 should be completed and documentation provided to all participants consistent with the Design Review

Timeline below. Also, precursor reviews should be completed.



### Design Review Timeline

- d. **Success Criteria.** The review board was able to conclude that the success criteria in Table G-5 was accomplished to complete the objectives of the CDR.

**Table G-5 – CDR Entrance and Success Criteria**

<b>Critical Design Review</b>	
<b>Entrance Criteria</b>	<b>Success Criteria</b>
<ol style="list-style-type: none"> <li>1. Successful completion of the PDR and responses has been made to all PDR open issues, or a timely closure plan exists for those remaining open.</li> <li>2. A preliminary CDR agenda, success criteria, and charge to the board have been agreed to by the technical team, project manager and review chair prior to the CDR.</li> <li>3. CDR technical products listed below for both hardware and software system elements have been made available to the cognizant participants prior to the review:               <ol style="list-style-type: none"> <li>a. Updated baselined documents, as required.</li> <li>b. Product build-to specifications for each hardware and software configuration item, along with supporting trade-off analyses and data.</li> <li>c. Fabrication, assembly, integration, and top-level test plans and procedures.</li> <li>d. Technical data (e.g., Integrated Schematics, Spares Provisioning List, engineering analyses, specifications, etc.).</li> <li>e. Interface Control Documents (e.g. Command and Telemetry List, instrumentation, electrical, mechanical, fluids &amp; gas interfaces, user interfaces)</li> <li>f. Preliminary Test Requirements document (e.g. Operational Limits and Constraints, acceptance criteria)</li> <li>g. Verification &amp; Validation Plan (including requirements and specification).</li> <li>h. Launch Site Operations Plan, including Checkout and Activation Plan.</li> <li>i. Updated risk assessment and mitigation.</li> <li>j. Updated schedule data.</li> <li>k. Updated logistics documentation.</li> <li>l. Software Design Review</li> <li>m. Updated LLIL.</li> <li>n. Subsystem-level and preliminary operations hazards analyses.</li> <li>o. Systems and subsystem certification plans and requirements (as needed).</li> <li>p. System hazard analysis with associated verifications.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. The detailed design is expected to meet the requirements with adequate margins at an acceptable level of risk.</li> <li>2. Interface control documents are appropriately matured to proceed with fabrication, assembly, integration and test, and plans are in place to manage any open items.</li> <li>3. High confidence exists in the product baseline, and adequate documentation exists and/or will exist in a timely manner to allow proceeding with fabrication, assembly, integration, and test.</li> <li>4. The product verification and product validation requirements and plans are complete.</li> <li>5. The testing approach is comprehensive, and the planning for system assembly, integration, test, and launch site and mission operations is sufficient to progress into the next phase.</li> <li>6. Adequate technical and programmatic margins and resources exist to complete the development within budget, schedule, and risk constraints.</li> <li>7. Risks to mission success are understood, and plans and resources exist to effectively manage them.</li> <li>8. Safety and mission assurance (i.e., safety, reliability, maintainability, quality, and EEE parts) have been adequately addressed in system and operational designs and any applicable S&amp;MA products (i.e., hazard analysis and failure modes and effects analysis) have been approved.</li> </ol>

**G.6 Demonstration Readiness Review (DRR)**

- a. A DRR ensures that the demonstration flight hardware/software, ground facilities (launch site and mission control), end-to-end communication systems, support personnel, and procedures are ready for flight testing and data acquisition, reduction, and control.
- b. A DRR is held prior to commencement of launch-specific launch site operations and prior to shipment of Dragon to the launch site.
- c. Entrance Criteria. Prior to the execution of a DRR, the activities and products identified in Table G-6 should be completed and documentation provided to all participants prior to the review.

- d. Success Criteria. The review board concludes that the success criteria in Table G-6 was accomplished to complete the objectives of a DRR.

**Table G-6 – DRR Entrance and Success Criteria**

Demo Readiness Review	
Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> <li>1. The objectives of the Demonstration Flight have been clearly defined and documented and that all of the mission plans and procedures support those objectives.</li> <li>2. Configuration of Demonstration Flight vehicle has been defined and agreed to.</li> <li>3. All applicable functional, unit level, subsystem, system, and qualification testing has been conducted successfully.</li> <li>4. All DRR specific data products have been made available to all participants prior to conducting the review.</li> <li>5. All known system discrepancies have been identified and dispositioned in accordance with an agreed upon plan.</li> <li>6. All previous design review success criteria and key issues have been satisfied in accordance with an agreed upon plan.</li> <li>7. All required launch resources (people (including a designated launch director), facilities and consumables, Demonstration Flight vehicle, ground control centers, ground data acquisition and control, flight telemetry and communications systems have been identified and are available to support the Demonstration Flight, or have an agreed upon closure plan.</li> <li>8. Roles and responsibilities of all launch participants are defined and agreed to.</li> <li>9. Mission contingency planning has been accomplished, and all personnel have been trained.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adequate mission plans and procedures are completed and approved.</li> <li>2. Adequate identification and coordination of required mission resources is completed</li> <li>3. Previous component, subsystem, system test results form a satisfactory basis for proceeding into planned mission.</li> <li>4. Risk level is identified and accepted by program/competency leadership as required.</li> <li>5. Plan to capture any lessons learned from the mission</li> <li>6. The objectives of the mission have been successfully validated.</li> <li>7. The mission design has been reviewed and analyzed as consistent with mission objectives.</li> <li>8. Launch operations personnel have received appropriate training in vehicle processing, flight operation, safety and contingency procedures.</li> <li>9. Facilities (launch site) and range documentation approved as required prior to flight.</li> <li>10. Mission goals defined, documented and agreed upon.</li> </ol>

ARTICLE 27 SIGNATURE BLOCK

The terms and conditions of SAA-NNJ06TA26S, as modified by this amendment are hereby incorporated herein

NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION

SPACE EXPLORATION TECHNOLOGIES  
CORPORATION

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 Systems  
 Date: 2/28/2008

BY: *Elon Musk*  
 Elon Musk  
 Chief Executive Officer  
 Date: 2/27/08