

**SPACE ACT AGREEMENT AMENDMENT ONE  
BETWEEN  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AND  
PARAGON SPACE DEVELOPMENT CORPORATION  
FOR  
COMMERCIAL CREW DEVELOPMENT (CCDev)**

PURPOSE AND AGENCY COMMITMENT

The purpose of this Amendment is to modify Space Act Agreement NNJ10TA03S to update the Appendix 2: Performance Milestones and Success Criteria and implement such other adjustments to timing and performance as agreed-to by NASA and Paragon.

NASA shall provide or identify all related ARRA guidance applicable to this Agreement as provided under ARTICLE 3. RESPONSIBILITIES, paragraph A.(3), no later than the date of NASA's acceptance of Milestone 1 of APPENDIX 2, as modified herein.

The last sentence of ARTICLE 5. FINANCIAL OBLIGATIONS, paragraph B.(1) is modified to read:

NASA and Paragon agree that time is of the essence for the payment of milestones hereunder and each will make best efforts to ensure that milestones are accepted (if appropriate) and invoiced prior to December 31, 2010.

APPENDIX 2 is removed and replaced in its entirety with the following:

**APPENDIX 2: Performance Milestones and Success Criteria**

**CCDev PARAGON SPACE DEVELOPMENT CORPORATION Company  
Project Milestones**

<p>Milestone 1: Customer Requirements Review (CRR):</p> <p>Requirements, as established by Paragon and their customers (commercial and their NASA customer), are imperative to enable an efficient design process that results in a useful and desirable product. CCT ARS requirements must be derived from the potential spacecraft integrators higher level requirements and the CCT ARS CRR must be completed.</p> <p>Paragon will conduct requirements reviews with participating commercial</p>	<p>Amount: \$ <u>350,000</u></p> <p>Date: March, 2010</p>
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<p>prime vehicle integrators and the NASA COTS program office to collect and incorporate top-level driving requirements into the design of the CCT ARS.</p> <p>Paragon will conduct a formal CCT ARS CRR and the following items will be finalized and released by the conclusion of the review:</p> <ol style="list-style-type: none"> <li>1) Systems Specification</li> <li>2) Interface Requirements Document</li> <li>3) Concept of Operations</li> <li>4) Draft Safety provisions</li> <li>5) Draft Subsystem Specifications</li> </ol> <p>Action Items may be open from the review as long as closure dates are agreed upon.</p> <p><i>Success Criteria: Customer Requirements Reviews completed with participating commercial prime vehicle integrators and the NASA COTS program office, and the formal CCT ARS CRR must be completed.</i></p>	
<p><b>Milestone 2: System Design Review (SDR):</b></p> <p>A thorough, proper requirements definition is required to ensure baseline performance, interface, and safety requirements are established. From this, the system must be carefully evaluated and clearly defined to drive to a final concept to be presented at SDR.</p> <p>The following items will be finalized and released or formalized by the conclusion of the CCT ARS SDR:</p> <ol style="list-style-type: none"> <li>1) Concept Layout</li> <li>2) Draft Master Equipment List (MEL)</li> <li>3) Draft Engineering Drawing List (EDL)</li> <li>4) Updated Safety Provisions List (describing safety concern, mitigation or elimination strategy and responsible party)</li> <li>5) Technical Memos if required to explain design chosen (e.g. trade studies)</li> <li>6) Rough Draft of Testing Plan</li> <li>7) Updated requirements documents from previous review if required</li> </ol> <p>Action Items may be open from the review as long as closure dates are agreed upon.</p> <p><i>Success Criteria: SDR completed and baseline design concept chosen.</i></p>	<p>Amount: \$ <u>514,000</u></p> <p>Date: April, 2010</p>
<p><b>Milestone 3: Preliminary Design Review (PDR):</b></p>	<p>Amount: \$ <u>330,000</u></p>

<p>A natural point for evaluation is at the end of a rigorous design cycle, at which time the design must be shown to meet requirements if built as designed.</p> <p>The following items will be finalized and released or formalized by the conclusion of the CCT ARS PDR:</p> <ol style="list-style-type: none"> <li>1) Final Subsystem Specifications at the Configuration Item (CI) level including all internal Interface Control Documents (ICDs)</li> <li>2) Full System Layout to CI level</li> <li>3) Final EDL and MEL</li> <li>4) Applicable Technical Plans:             <ul style="list-style-type: none"> <li>o Draft Manufacturing Plan (fabrication, integration)</li> <li>o Draft CI and System Test Plan (Draft Verification Plan)</li> </ul> </li> <li>5) Long Lead Items list and Procurement Plan</li> <li>6) Failure Modes and Effect Analysis (FMEA)</li> <li>7) Reliability Analysis</li> <li>8) Technical Data Package of pertinent performance analysis</li> <li>9) Additional Safety provisions update</li> </ol> <p>Action Items may be open from the review as long as closure dates are agreed upon.</p> <p><i>Success Criteria: PDR objectives are to fully describe the design to sufficient detail to show that it will meet requirements as stated.</i></p>	<p>Date: July, 2010</p>
<p>Milestone 4: EDU Assembly Report: Successful manufacture of all components is confirmed when each passes functional check-outs.</p> <p>The EDU Assembly Report will specifically provide:</p> <ol style="list-style-type: none"> <li>1) Pictures of each manufactured component</li> <li>2) Functional testing criteria for each component</li> <li>3) Results and data analysis that demonstrate functional criteria were met</li> <li>4) Conclusions and findings specifically regarding impact to integration and performance testing</li> </ol> <p><i>Success Criteria: All necessary documentation is complete for all CCT ARS component hardware and the top-level assembly.</i></p>	<p>Amount: \$ <u>130,000</u></p> <p>Date: October, 2010</p>
<p>Milestone 5: Integrated Ground Test in Relevant Spacecraft Environment and Program Final Report:</p>	<p>Amount: \$ <u>119,600</u></p> <p>Date: December, 2010</p>

<p>Results of the integrated ground system test will be documented to include:</p> <ol style="list-style-type: none"> <li>1) Executed integration procedures and picture(s) of the integrated hardware</li> <li>2) Integration testing criteria</li> <li>3) Results and data analysis that address all test criteria</li> <li>4) Conclusions and findings specific to ease of integration and system performance with respect to test criteria</li> </ol> <p>A final report summarizing the CCT ARS development program will be prepared and submitted. Specific sections in the report will include the following:</p> <ol style="list-style-type: none"> <li>1) A summary of the CCT ARS EDU development</li> <li>2) Lessons learned</li> <li>3) Path forward to CDR</li> </ol> <p><i>Success Criteria: Ground testing completed and documented, and the Program Final Report is completed.</i></p>	
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ARTICLE 27 SIGNATURE BLOCK

The terms and conditions of Space Act Agreement NNJ10TA03S, as modified by this amendment are hereby incorporated herein

NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION

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DATE: 2-19-2010

DATE: 02-18-10