

NONREIMBURSABLE SPACE ACT AGREEMENT  
BETWEEN  
AD ASTRA ROCKET COMPANY  
AND  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
FOR  
DEMONSTRATION OF  
THE VARIABLE SPECIFIC IMPULSE MAGNETOPLASMA ROCKET (VASIMR™)  
ABOARD THE INTERNATIONAL SPACE STATION

ARTICLE 1. AUTHORITY AND PARTIES

In accordance with The National Aeronautics and Space Act of 1958, as amended (42 U.S.C. 2473 (c)), this Agreement is entered into by the National Aeronautics and Space Administration, through its International Space Station (ISS) Program, Lyndon B. Johnson Space Center located at 2101 NASA Parkway, Houston, Texas 77058 (hereinafter referred to as "NASA ISS" or "NASA") and Ad Astra Rocket Company located at 141 W. Bay Area Blvd, Webster, TX 77598, (hereinafter referred to as "AD ASTRA"). NASA and AD ASTRA may be individually referred to as a "Party" and collectively referred to as the "Parties."

ARTICLE 2. PURPOSE AND NASA'S COMMITMENT

The purpose of this Agreement is to facilitate and conduct a space flight test of a VASIMR™ engine on the ISS (the "Project"). The Parties hereby agree to embark on a series of sequential phased activities to achieve this objective. The phases will be linked by a series of "Gates," as described in ARTICLE 4 hereof. Passage through each Gate will occur upon the successful completion of a predetermined set of requirements and development of required agreement documents, as agreed to by the Parties. Fulfillment of each Gate is a necessary and sufficient condition to proceed to the next phase.

ARTICLE 3. BACKGROUND

The VASIMR™ engine is a new plasma-based space propulsion technology initially studied by NASA and currently under commercial development by AD ASTRA. NASA has supported the VASIMR™ technology development through two previous Space Act Agreements with Ad Astra: SAA8-051659 (June 23, 2005) and SAA-AT-07-007 (Dec. 10, 2007). In addition, NASA plans to operate a share of the U.S. accommodation on the ISS as a national laboratory in accordance with the NASA Authorization Act of 2005, Section 507 (P.L. 109-155). This Project with the VASIMR™ test serves as a "pathfinder" for the ISS National Laboratory by demonstrating a new class of larger, more complex class of science and technology payloads, encouraging others to pursue similar projects and facilitate their efforts by providing a model for implementation. These larger, more complex classes of payloads require a larger effort by NASA to fully integrate them with the ISS and this multi-gate approach will allow NASA to assess the requirements on an incremental basis while proceeding to flight.



Discussions between NASA and AD ASTRA, aimed at a VASIMR™ ISS demonstration have been ongoing since 2005 under previous agreements. A number of joint NASA/AD ASTRA studies and assessments have been conducted, which support the technical feasibility of such a test and have led to the present concept of a 200 kW VASIMR™ package, operated in short bursts of up to several minutes from a battery pack periodically charged by the ISS power bus. In addition, the NASA/AD ASTRA technical team has identified a Common Attach System (CAS) site on the main truss as the most desirable location for this test. Based on these considerations, the Parties have decided to pursue the VASIMR™ test under the terms and conditions of this Agreement.

#### ARTICLE 4. GATES

Five Gates are identified that constitute important milestones in the ultimate completion of the Project. Some of these Gates are achieved by the successful completion of scheduled reviews and development of appropriate follow-on agreements, which are critical to maintaining the Project's momentum and which should not be unreasonably withheld or delayed. In the event that any Gate is not met by either Party, an assessment of the impact thereof to the Project will be carried out by the Parties to determine the best alternative course of action. Any follow-on agreements or modification agreed to by the Parties in the course of implementing the Project as described herein shall be fully incorporated in this Agreement and shall constitute a modification of this Agreement in accordance with Article 21, MODIFICATIONS.

The five Gates are described as follows:

GATE 1. Execution of a Payload Integration Agreement (PIA).

This Gate is the initial document that specifies the generic and unique agreements between NASA and AD ASTRA for the flight to and on the ISS. Execution of an appropriate PIA and completion of Gate 1 is contingent on the successful completion of the Pre-Gate 1 activities (as set forth in Article 5, ROLES AND RESPONSIBILITIES).

GATE 2. Successful system level Preliminary Design Review (PDR) complete (as reasonably determined by the Parties).

This Gate demonstrates that the preliminary design of the Project meets all system requirements with acceptable risk and within the cost and schedule constraints that the Parties set forth in their respective portions for integration and establishes the basis for proceeding with detailed design. It shows that the correct design option has been selected, interfaces have been identified, and verification methods have been described. Full baseline cost and schedules for the Parties integration portions, as well as risk assessments, management systems, and metrics are presented.

GATE 3. System level Critical Design Review (CDR) complete (as reasonably determined by the Parties).



This Gate insures that the maturity of the design of the Project is appropriate to support proceeding with full scale fabrication, assembly, integration, and test, and 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 for NASA's integration. The final on orbit allocation, targeted launch carrier and launch manifest opportunity will have been selected by this time through the successful award under a National Lab Announcement. This allocation will be in compliance with NASA's plans to operate a share of U.S. accommodation on the ISS as a national laboratory.

GATE 4. Successful completion of VF-200 Flight Unit Certification of Flight Readiness (COFR) Documentation and pre-shipping review (as reasonably determined by NASA).

This Gate provides for a review that examines all tests, demonstrations, analyses and audits that determine the system's readiness for a safe and successful flight and for subsequent flight operations. It also ensures that all flight and ground hardware, software, personnel and procedures are operationally ready.

GATE 5. Successful system level Launch Readiness Review (LRR) (as reasonably determined by the Parties).

This Gate is the final Gate that occurs prior to actual launch in order to verify that the Project's Payload is ready for launch.

## ARTICLE 5. ROLES AND RESPONSIBILITIES

This Agreement is intended to provide the initial pre-Gate 1 (development of the PIA) roles and responsibilities for NASA and AD ASTRA and to provide the roles and responsibilities for the remaining Gates for the implementation as the Project proceeds through the gates as described in Article 4, GATES. The general philosophy defining specific roles and responsibilities is based on each Party providing it's "own side of the interface." Following this approach, the following roles and responsibilities are defined.

### A. AD ASTRA

AD ASTRA shall use reasonable efforts to continue the maturation of the VASIMR™ technology to a readiness level capable of safely satisfying the mission requirements of the ISS test. AD ASTRA will be solely responsible for hardware design, development, manufacture, testing, system integration, as well as mockup development, operational procedures, ground test equipment development and the operational infrastructure to carry out a full-scale flight program. Details of specific roles and responsibilities for each subsequent Gate will be further refined upon successful completion of a preceding Gate and any modifications will be in accordance with Article 21, MODIFICATIONS. Key elements of AD ASTRA's long-term responsibilities throughout all Gates of this Agreement are as follows:

1. Develop a Mission Requirements Document jointly approved with NASA, including the launch, on-orbit operation, and end-of-mission requirements.



2. Develop an Operations Concept for the payload, including activation on-orbit, testing, firing protocols, operational constraints, Extravehicular Activity (EVA) and on-orbit maintenance.
3. Develop (Payload) System Requirements, including Electromagnetic Interference (EMI) constraints, safety requirements, thermal environment, electrical, avionics, and software.
4. Design, manufacture and test the payload hardware. This responsibility includes all activities leading up to the final delivery of the VASIMR™ payload, including full design of the VF-200 and supporting platform structure, stored energy module (batteries), vacuum chamber testing of the engine components and subsequent integration and test of the full system. This responsibility also includes evaluation, including: VASIMR™ systems engineering and integration, thermal management and control VASIMR™ power system requirements and interfaces, command and data system requirements, superconducting magnet system and electromagnetic effects, plasma plume, EMI and other environmental effects.
5. Develop the payload Neutral Buoyancy Lab (NBL) mockups and work with NASA on the development of EVA installation, servicing and contingency procedures and hardware fit checks.
6. Deliver VASIMR™ data (ground and flight) to NASA.
7. Conduct VASIMR™ unique ground tests. These tests include: engine performance measurements, plume data, measurement of EMI spectrum, thermal, plasma erosion and lifetime testing.
8. Develop the Project documentation as required by the PIA.
9. Provide the design and fabrication of the ground system element. This activity encompasses ground test hardware, software, procedures, transportation and ground handling equipment.
10. Support the launch and transfer system elements.
11. Provide the required documentation and data sets for the various reviews (PDR, SRR, etc.), including test and verification data, drawings, analysis and all pertinent information required to support the reviews.
12. Provide the necessary safety data, support all the required safety and technical reviews, and provide the necessary documentation for these, including failure mode and hazard analysis/tracking data and hazard closure documentation to enable NASA to review and approve the payload documentation for flight safety.
13. Maintain and control the Project's schedule and configuration control. AD ASTRA will assign a Project Manager for overall Project and schedule control. In addition, the Project Manager will be responsible for ensuring strict protocols in configuration control and Project management. The AD ASTRA Project Manager will work closely with the NASA Payload Integration Manager to ensure clear and organized communications across the AD ASTRA NASA interface.
14. Determine and provide the disposal of the test engine after completion of all testing if launched and operated on the ISS.



## B. NASA

During the Pre-Gate 1 phase of this Agreement, NASA will use reasonable efforts to:

1. Provide standard ISS payload services to AD ASTRA which includes detailed assessment of the resources needed to carry out the remainder of the Project.
2. Provide ISS interface information and capabilities for proposed testing sites on ISS (and NASA-provided vehicles as necessary), including:
  - a. Power systems
  - b. Command and data systems
  - c. Structural interfaces
  - d. EMI/EMC
  - e. Thermal environment
  - f. Ground systems/environment (as necessary)
  - g. EVA interface requirements
  - h. Robotics systems requirements
  - i. Operational constraints
  - j. Safety requirements
  - k. NASA ISS scheduling constraints
3. Evaluate VASIMR<sup>TM</sup> interface information relating to proposed sites and identify issues.
4. Respond to AD ASTRA questions and support meetings with AD ASTRA teams for evaluation of VASIMR<sup>TM</sup> on ISS.
5. Based upon AD ASTRA inputs of VASIMR interface and resource requirements relating to the ISS site and vehicle capabilities, determine the most appropriate interface configuration the ISS can accommodate, provide site and vehicle recommendations, and determine whether additional funding to the NASA ISS Program from NASA Headquarters is needed to implement.
6. Identify a Payload Integration Manager (PIM) as a single point of contact for AD ASTRA with respect to the technical and programmatic execution of the Project. The PIM will coordinate the NASA ISS support needed for reviews and technical questions in unique areas of direct relevance (interfaces/environments) to the ISS, including electrical (particularly batteries), thermal, structural and flight safety. The PIM will also facilitate in the resolution of issues and work with AD ASTRA on schedule milestones and products needed by the NASA ISS program. Additionally, the PIM will help AD ASTRA coordinate any proposed interface exceptions with the engineering team to ensure that they are evaluated and analyzed to determine if they are acceptable.
7. Release National Lab Opportunity Announcement.

Details of specific roles and responsibilities for each subsequent Gate will be further refined upon successful completion of a preceding Gate and any modifications will be in accordance with Article 21, MODIFICATIONS. Key elements of NASA's long-term responsibilities throughout all Gates of the Agreement are as follows:

1. Provide input to the Mission Requirements Document.
2. Develop the "VASIMR<sup>TM</sup> to ISS Interface Control Document" with AD ASTRA's input. The ICD Engineer and Payload Engineering Integration Team will work with AD ASTRA and the ISS teams on any non-standard interfaces or proposed exceptions.



3. Review safety products at the Phase I/II/III Safety Reviews. Additionally, NASA will work with AD ASTRA on any safety issues that are identified and consult with the Payload Safety Review Panel on issues and solutions and will endeavor to help identify any unique VASIMR™ safety issue that may not be readily apparent.
4. Identify the VASIMR™ payload in the ISS manifest subject to the selection under a National Lab Opportunity Announcement.
5. Provide technical data for proposed ISS sites (and NASA-provided vehicles as may be available) describing: power systems, command and data systems, structural interfaces, EMI/EMC, thermal environment, ground systems/environment (as necessary), EVA/Robotics interface and system requirements, operational constraints, safety and NASA ISS scheduling constraints.
6. Provide mission-unique interface hardware (e.g. Grapple fixture) and software for the VASIMR™ payload as documented in the PIA.
7. Support the standard payload to carrier integration activities, payload certification, and payload safety certification for the launch vehicle (If launched on a NASA Launch Vehicle) and the ISS.
8. If the AD ASTRA payload is launched on a NASA Launch Vehicle, provide the necessary launch support facilities and perform related services for VASIMR™ final assembly, testing and check-out at the launch site, as well as control center accommodations for VASIMR™ operation and monitoring as required for the launch, transfer and operations on ISS.
9. Provide data related to VASIMR™ housekeeping, science and carrier-ancillary data products to the VASIMR™ team at a designated NASA data handling and distribution center.
10. Provide training related to launch vehicle and ISS operations, including EVA and Robotics and support the development of training requirements and testing; provide the necessary test facilities required for ISS certification. This responsibility may include, but is not limited to, ISS electrical and power simulators, the Neutral Buoyancy Laboratory, vibration test facilities, acoustic test facilities, EMI test facilities, and ISS interface test facilities.

#### ARTICLE 6. FINANCIAL OBLIGATIONS

There will be no transfer of funds or other financial obligations between the Parties under this Agreement and each Party will fund its own participation. All activities under or pursuant to this Agreement are subject to the availability of funds, and no provision of this Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, Title 31 U.S.C. § 1341.

#### ARTICLE 7. PRIORITY OF USE

Any schedule or milestone in this Agreement is estimated based upon the Parties' current understanding of the projected availability of NASA personnel, test facilities and equipment. In the event either Party's projected availability changes, that Party shall give the other Party reasonable written notice of that change, so that the schedule and milestones may be adjusted accordingly. The Parties agree that NASA usage of the test facilities, equipment, and personnel



shall have priority over the usage planned in this Agreement. Should a conflict arise, NASA in its sole discretion shall determine whether to exercise that priority. Likewise, should a conflict arise as between two commercial users, NASA, in its sole discretion, shall determine the priority as between the two users. This Agreement does not obligate NASA to seek alternative government property or services under the jurisdiction of NASA at other locations.

#### ARTICLE 8. NONEXCLUSIVITY

This Agreement is not exclusive, with the sole exception that NASA will not enter into similar Space Act Agreements for the purpose of commercialization of the VASIMR™ technology in the licensed fields of propulsion or plasma production with other U.S. private or public entities, except for entities part of the U.S. Government.

#### ARTICLE 9. LIABILITY AND RISK OF LOSS

1. The objective of this Article is to establish a cross-waiver of liability in the interest of encouraging participation in the exploration, exploitation, and use of outer space through the International Space Station (ISS). The Parties intend that the cross-waiver of liability be broadly construed to achieve this objective.

2. For the purposes of this Article:

a. The term "Damage" means:

- (i) Bodily injury to, or other impairment of health of, or death of, any person;
- (ii) Damage to, loss of, or loss of use of any property;
- (iii) Loss of revenue or profits; or
- (iv) Other direct, indirect, or consequential Damage.

b. The term "Launch Vehicle" means an object, or any part thereof, intended for launch, launched from Earth, or returning to Earth which carries Payloads, persons, or both.

c. The term "Partner State" includes each Contracting Party for which the Agreement Among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America concerning Cooperation on the Civil International Space Station (IGA) has entered into force, pursuant to Article 25 of the IGA or pursuant to any successor agreement. A Partner State includes its Cooperating Agency. It also includes any entity specified in the Memorandum of Understanding (MOU) between NASA and the Government of Japan to assist the Government of Japan's Cooperating Agency in the implementation of that MOU.

d. The term "Payload" means all property to be flown or used on or in a Launch Vehicle or the ISS.

e. The term "Protected Space Operations" means all Launch Vehicle or Transfer Vehicle activities, ISS activities, and Payload activities on Earth, in outer space, or in transit between

Earth and outer space in implementation of this Agreement (including any modifications to this Agreement, such as the PIA), the IGA, MOUs concluded pursuant to the IGA, and implementing arrangements. It includes, but is not limited to:

- (i) Research, design, development, test, manufacture, assembly, integration, operation, or use of Launch Vehicles or Transfer Vehicles, the ISS, Payloads, or instruments, as well as related support equipment and facilities and services; and
- (ii) All activities related to ground support, test, training, simulation, or guidance and control equipment and related facilities or services.

“Protected Space Operations” also includes all activities related to evolution of the ISS, as provided for in Article 14 of the IGA.

“Protected Space Operations” excludes activities on Earth which are conducted on return from the ISS to develop further a Payload's product or process for use other than for ISS-related activities in implementation of the IGA.

f. The term “Related Entity” means:

- (i) A contractor or subcontractor of a Party or a Partner State at any tier;
- (ii) A user or customer of a Party or a Partner State at any tier; or
- (iii) A contractor or subcontractor of a user or customer of a Party or a Partner State at any tier.

The terms “contractor” and “subcontractor” include suppliers of any kind.

The term “Related Entity” may also apply to a State, or an agency or institution of a State, having the same relationship to a Partner State as described in paragraphs (2)(f)(i) through (2)(f)(iii) of this Article or otherwise engaged in the implementation of Protected Space Operations as defined in paragraph (2)(e) above.

g. The term “Transfer Vehicle” means any vehicle that operates in space and transfers Payloads or persons or both between two different space objects, between two different locations on the same space object, or between a space object and the surface of a celestial body. A Transfer Vehicle also includes a vehicle that departs from and returns to the same location on a space object.

3. Cross-waiver of liability:

a. Each Party agrees to a cross-waiver of liability pursuant to which each Party waives all claims against any of the entities or persons listed in paragraphs (3)(a)(i) through (3)(a)(iv) of this Article based on Damage arising out of Protected Space Operations. This cross-waiver shall apply only if the person, entity, or property causing the Damage is involved in Protected Space



Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations. The cross-waiver shall apply to any claims for Damage, whatever the legal basis for such claims, against:

- (i) Another Party;
- (ii) A Partner State other than the United States of America;
- (iii) A Related Entity of any entity identified in paragraph (3)(a)(i) or (3)(a)(ii) of this Article; or
- (iv) The employees of any of the entities identified in paragraphs (3)(a)(i) through (3)(a)(iii) of this Article.

b. In addition, each Party shall, by contract or otherwise, extend the cross-waiver of liability, as set forth in paragraph (3)(a) of this Article, to its Related Entities by requiring them, by contract or otherwise, to:

- (i) Waive all claims against the entities or persons identified in paragraphs (3)(a)(i) through (3)(a)(iv) of this Article; and
- (ii) Require that their Related Entities waive all claims against the entities or persons identified in paragraphs (3)(a)(i) through (3)(a)(iv) of this Article.

c. For avoidance of doubt, this cross-waiver of liability includes a cross-waiver of claims arising from the Convention on International Liability for Damage Caused by Space Objects, which entered into force on September 1, 1972, where the person, entity, or property causing the Damage is involved in Protected Space Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations.

d. Notwithstanding the other provisions of this Article, this cross-waiver of liability shall not be applicable to:

- (i) Claims between a Party and its own Related Entity or between its own Related Entities;
- (ii) Claims made by a natural person, his/her estate, survivors or subrogees (except when a subrogee is a Party to this Agreement or is otherwise bound by the terms of this cross-waiver) for bodily injury to, or other impairment of health of, or death of, such person;
- (iii) Claims for Damage caused by willful misconduct;
- (iv) Intellectual property claims;
- (v) Claims for Damage resulting from a failure of a Party to extend the cross-waiver of liability to its Related Entities, pursuant to paragraph (3)(b) of this Article; or



(vi) Claims by a Party arising out of or relating to another Party's failure to perform its obligations under this Agreement.

e. Nothing in this Article shall be construed to create the basis for a claim or suit where none would otherwise exist.

## ARTICLE 10. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

### 1. General

(a) "Related Entity" as used in this Data Rights clause, means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or AD ASTRA that is assigned, tasked, or contracted with to perform specified NASA or AD ASTRA activities under this Agreement.

(b) "Data," as used in this Data Rights clause, means recorded information, regardless of form, the media on which it may be recorded, or the method of recording. The term includes, but is not limited to, data of a scientific or technical nature, computer software and documentation thereof, and data comprising commercial and financial information.

(c) "Proprietary Data," as used in this Data Rights clause, means Data embodying trade secrets or comprising commercial or financial information that is privileged or confidential.

(d) The Data rights set forth herein are applicable to employees of NASA and/or AD ASTRA and employees of any Related Entity of NASA and/or AD ASTRA. NASA and/or AD ASTRA shall ensure that their respective employees and employees of any Related Entity that perform NASA and/or AD ASTRA activities under this Agreement are aware of the obligations under this clause and that all such employees are bound to such obligations.

(e) Data exchanged between NASA and AD ASTRA under this Agreement will be exchanged without restriction as to its disclosure, use, or duplication except as otherwise provided in this clause.

(f) No preexisting Proprietary Data will be exchanged between the Parties under this Agreement unless specifically authorized in this clause or in writing by the owner of the Proprietary Data.

(g) In the event that Data exchanged between NASA and AD ASTRA include a restrictive notice that NASA or AD ASTRA deems to be ambiguous or unauthorized, NASA or AD ASTRA may notify the other Party of such condition. Notwithstanding such a notification, as long as the restrictive notice provides an indication that a restriction on use or disclosure was intended, the Party receiving such Data will treat the Data pursuant to the requirements of this clause unless otherwise directed in writing by the Party providing such Data.

(h) Notwithstanding any restriction on use, disclosure, or reproduction of Data provided in this clause, the Parties will not be restricted in the use, disclosure, or reproduction of Data provided under this Agreement that:

(i) is publicly available at the time of disclosure or thereafter becomes publicly available without breach of this Agreement;

(ii) is known to, in the possession of, or developed by the receiving Party independent of carrying out the receiving Party's responsibilities under this Agreement and independent of any disclosure of, or without reference to, Proprietary Data or otherwise protectable Data hereunder;

(iii) is received from a third party having the right to disclose such information without



restriction; or

(iv) is required to be produced or released by the receiving Party pursuant to a court order or other legal requirement.

(i) If either NASA or AD ASTRA believes that any of the events or conditions that remove restriction on the use, disclosure, or reproduction of the Data apply, NASA or AD ASTRA will promptly notify the other Party of such belief prior to acting on such belief, and, in any event, will notify the other Party prior to an unrestricted use, disclosure, or reproduction of such Data.

(j) Disclaimer of Liability: Notwithstanding any restriction on use, disclosure, or reproduction of Data provided in this clause, neither NASA nor AD ASTRA will be restricted in, nor incur any liability for, the use, disclosure, or reproduction of any Data not identified with a suitable restrictive notice in accordance with paragraphs 2 and 8 of this clause or of any data included in Data which one Party has furnished, or is required to furnish to the other Party or to the U.S. Government without restriction on disclosure and use.

(k) Parties may use the following, or a similar, restrictive notice as required by paragraphs 2 and 8 of this clause. In addition to identifying Proprietary Data with such a restrictive notice, the Parties should mark each page containing Proprietary Data with the following, or a similar, legend: "Proprietary Data – use and disclose only in accordance with notice on title or cover page."

#### Proprietary Data Notice

These Data herein include [enter as applicable: "Background Data" or "Data Produced by AD ASTRA or NASA *as applicable* under a Space Act Agreement"] in accordance with the Data Rights provisions under Space Act Agreement [provide applicable identifying information] and embody Proprietary Data. In accordance with the Space Act Agreement, AD ASTRA or NASA as applicable will use reasonable efforts to maintain the data in confidence and limit use, disclosure, and reproduction by AD ASTRA or NASA as applicable and any Related Entity of AD ASTRA or NASA as applicable in accordance with restrictions identified in the Space Act Agreement [may list specific restrictions listed in the Agreement].

#### 2. Data First Produced by AD ASTRA Under this Agreement

In the event Data first produced by AD ASTRA in carrying out AD ASTRA responsibilities under this Agreement is furnished to NASA, and AD ASTRA considers such Data to be Proprietary Data, and such Data is identified with a suitable restrictive notice, NASA will use reasonable efforts to maintain the Data in confidence and such Data will be disclosed and used by or on behalf of the U.S. Government (under suitable protective conditions) only for U.S. Government purposes.

#### 3. Data First Produced by NASA Under this Agreement

Except for Data disclosing an invention owned by NASA for which patent protection is being considered, in the event AD ASTRA requests that Data first produced by NASA (or any Related Entity of NASA) in carrying out NASA's responsibilities under this Agreement be maintained in confidence, and to the extent NASA determines that such Data would be Proprietary Data if it had been obtained from AD ASTRA, NASA will mark such Data with a restrictive notice and will maintain such marked Data in confidence for a period of 2 years after development of the



Data, with the express understanding that during the aforesaid restricted period such marked Data may be disclosed and used (under suitable protective conditions) by or on behalf of the U.S. Government for U.S. Government purposes only, and thereafter for any purpose whatsoever without restriction on disclosure and use. AD ASTRA agrees to use reasonable efforts not to disclose such marked Data to any third party without NASA's written approval until the aforesaid restricted period expires.

#### 4. Publication of Results

Recognizing that section 203 of the National Aeronautics and Space Act of 1958 (42 U.S.C. § 2473), as amended, requires NASA to provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof, and that the dissemination of the results of NASA activities is one of the considerations for this Agreement, the Parties agree to coordinate proposed publication of results with each other in a manner that allows each Party a reasonable amount of time to review and comment on proposed publications.

#### 5. Data Disclosing an Invention

In the event Data exchanged between NASA and AD ASTRA discloses an invention for which patent protection is being considered, the furnishing Party specifically identifies such Data, and the disclosure and use of such Data is not otherwise limited or restricted herein, the receiving Party agrees to withhold such Data from public disclosure for a reasonable time (presumed to be 2 years unless mutually agreed otherwise or unless such information is restricted for a longer period herein) in order for patent protection to be obtained.

#### 6. Copyright

In the event Data is exchanged with a notice indicating that the Data is copyrighted and there is no indication that such Data is subject to restriction under paragraphs 2 or 3 of this clause (i.e., Data is not marked with a restrictive notice as required by paragraphs 2 or 3 of this clause), such Data will be presumed to be published and the following royalty-free licenses will apply.

(a) If it is indicated on the Data that the Data existed prior to, or was produced outside of, this Agreement, the receiving Party and others acting on its behalf, may reproduce, distribute, and prepare derivative works only for carrying out the receiving Party's responsibilities under this Agreement.

(b) If the Data does not contain the indication of (a) above, the Data will be presumed to have been first produced under this Agreement and, except as otherwise provided in paragraph 5 of this clause and in the Inventions and Patent Rights clause of this Agreement for protection of reported inventions, the receiving Party and others acting on its behalf may reproduce, distribute, and prepare derivative works for any purpose.

#### 7. Data Subject to Export Control

Technical data, whether or not specifically identified or marked, that is subject to the export laws and regulations of the United States and that is provided by one Party to the other Party under this Agreement will be treated as such, and will not be further provided to any foreign persons or



transmitted outside the United States without proper U.S. Government authorization, where required.

## 8. Background Data

(a) In the event AD ASTRA furnishes NASA with Data developed at private expense (or in the case of state or local government, Data developed at government expense) that existed prior to, or was produced outside of, this Agreement, and such Data embody Proprietary Data, and such Data is so identified with a suitable restrictive notice, NASA will use reasonable efforts to maintain the Data in confidence and such Data will be disclosed and used by NASA and any Related Entity of NASA (under suitable protective conditions) only for carrying out NASA responsibilities under this Agreement. Upon completion of activities under this Agreement, such Data will be disposed of as requested by AD ASTRA.

(b) At the time of execution of this Agreement, the Parties agree that the following Background Data embodies Proprietary Data that will be provided to NASA: VASIMR™ design and performance data may be required by NASA. VASIMR™ test platform design and performance data may be required by NASA.

## 9. Handling of Data

(a) In the performance of this Agreement, AD ASTRA and any Related Entity of AD ASTRA may have access to, be furnished with, or use the following categories of Data:

- (i) Proprietary Data of third parties that the U.S. Government has agreed to handle under protective arrangements; and/or
- (ii) U.S. Government Data, the use and dissemination of which, the U.S. Government intends to control.

(b) Data provided by NASA to AD ASTRA under the Agreement

(i) At the time of execution of this Agreement, the Parties agree that the following Proprietary Data of third parties will be provided to AD ASTRA with the express understanding that AD ASTRA will use and protect such Data in accordance with this clause:

"Not Applicable"

(ii) At the time of execution of this Agreement, the Parties agree that the following U.S. Government Data will be provided to AD ASTRA with the express understanding that AD ASTRA will use and protect such U.S. Government Data in accordance with this clause:

"Not Applicable"

(iii) At the time of execution of this Agreement, the Parties agree that the following software and related Data will be provided to AD ASTRA under a separate Software Usage Agreement with the express understanding that AD ASTRA will use and protect such related Data in accordance with this clause. Unless retention of such Data is otherwise authorized under the Software Usage Agreement or AD ASTRA has entered into a license, consistent with 37 C.F.R. Part 404, for software provided under this Agreement, upon completion of activities under this Agreement, such related Data will be disposed of as instructed by NASA: "Not Applicable"

(c) With respect to such Data specifically identified in this Agreement or specifically marked with a restrictive notice, the Parties agree to:

- (i) Use, disclose, or reproduce such Data only to the extent necessary to perform the work required under this Agreement;



- (ii) Safeguard such Data from unauthorized use and disclosure;
- (iii) Allow access to such Data only to its employees and any Related Entity(ies) that require access for their performance under this Agreement;
- (iv) Except as otherwise indicated in (c)(iii) above, preclude access and disclosure of such Data outside the Parties respective organizations;
- (v) Notify its employees who may require access to such Data about the obligations under this clause and ensure that such employees comply with such obligations, and notify its Related Entity(ies) that may require access to such Data about their obligations under this clause; and
- (vi) Return or dispose of such Data, as the Parties may direct to one another in writing, when the Data is no longer needed for performance under this Agreement.

#### 10. Oral and visual information

If information that the Parties consider to be Proprietary Data is disclosed orally or visually to one Party or the other, the Party to whom such Proprietary Data is disclosed will have no duty to limit or restrict, and will not incur any liability for, any disclosure or use of such information unless: (a) the Disclosing Party orally informs the Receiving Party before initial disclosure that such information is considered to be Proprietary Data, and (b) the Disclosing Party reduces such information to tangible, recorded form that is identified and marked with a suitable restrictive notice as required by paragraphs 2 and 8 above and furnishes the resulting Data to the Receiving Party within 10 days after such oral or visual disclosure.

#### 11. Classified Material

In the event that access to, acquisition of, or delivery of classified material is required under this Agreement, AD ASTRA must provide a completed Contract Security Classification Specification (DD Form 254 or equivalent) to the NASA Point of Contact identified herein. Transmission and access to classified material shall be in accordance with NASA and U.S Federal Government statutes, regulations, and policies.

### ARTICLE 11. INTELLECTUAL PROPERTY RIGHTS - PATENT AND INVENTION RIGHTS

#### 1. General

(a) "Related Entity" as used in this Invention and Patent Rights clause means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or AD ASTRA that is assigned, tasked, or contracted with to perform specified NASA or AD ASTRA activities under this Agreement.

(b) Based on the purpose and scope of this Agreement, and the responsibilities of the Parties, NASA has made an administrative determination that the provisions of section 305(a) of the National Aeronautics and Space Act of 1958, as amended (42 U.S.C. § 2457(a)), do not apply to this Agreement. Therefore, title to inventions made (conceived or first actually reduced to practice) as a result of activities performed under this Agreement will remain with the respective inventing Party(ies), and no invention or patent rights are exchanged between or granted by such Party(ies) under this Agreement except as provided herein.



(c) The invention and patent rights set forth herein are applicable to employees of AD ASTRA, any related Entity of AD ASTRA, employees of any Related Entity of AD ASTRA, any Related Entity of NASA and employees of any Related Entity of NASA. AD ASTRA shall ensure that its employees, its Related Entities and employees of any Related Entity that perform AD ASTRA activities under this Agreement are aware of the obligations under this clause and that all such Related Entities and employees are bound to such obligations. NASA shall insure that its Related Entities and employees of its Related Entities that perform NASA activities under this Agreement are aware of the obligations under this clause and that all such Related Entities and employees of such Related Entities are bound to such obligations.

## 2. NASA Inventions

Upon request, NASA will use reasonable efforts to grant AD ASTRA, consistent with the requirements of 37 C.F.R. Part 404, a license on terms to be subsequently negotiated to any NASA invention made as a result of activities performed under this Agreement on which NASA decides to file a patent application. This license will be subject to the rights reserved in paragraph 5(a) below.

## 3. NASA Related Entity Inventions

In the event that inventions are made under this Agreement by employees of a NASA Related Entity or jointly between NASA employees and employees of a NASA Related Entity, and NASA has the right to acquire or has acquired title to such inventions, NASA will use reasonable efforts to report such inventions to AD ASTRA. Upon request, NASA will use reasonable efforts to grant AD ASTRA, consistent with the requirements of 37 C.F.R. Part 404, a license on terms to be subsequently negotiated to any such invention on which NASA has acquired title and decides to file a patent application. This license will be subject to the rights reserved in paragraph 5(b) below.

## 4. Joint Inventions With AD ASTRA

NASA and AD ASTRA agree to use reasonable efforts to identify and report to each other, and to cooperate with each other in obtaining patent protection on, any inventions made jointly between NASA employees (or employees of a NASA Related Entity) and employees of AD ASTRA. Upon timely request, NASA may, at its sole discretion and subject to the applicable rights reserved in paragraph 5 below:

(a) agree to refrain from exercising its undivided interest in a manner inconsistent with AD ASTRA's commercial interests; or

(b) use reasonable efforts to grant AD ASTRA, consistent with the requirements of 37 C.F.R. Part 404, an exclusive or partially exclusive license on terms to be subsequently negotiated to NASA's undivided interest in such joint inventions.

## 5. Rights to be Reserved in AD ASTRA's License

Any license granted to AD ASTRA pursuant to paragraphs 2, 3, or 4 above will be subject to the reservation of the following rights:



(a) As to inventions made solely or jointly by NASA employees, NASA reserves the irrevocable, royalty free right of the Government of the United States to practice the invention or have the invention practiced on behalf of the United States or on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(b) As to inventions made solely or jointly by employees of a NASA Related Entity, NASA reserves the rights as set forth in paragraph (a) above, as well as the revocable, nonexclusive, royalty-free license in the Related Entity as set forth in 14 C.F.R. § 1245.108 or 37 C.F.R. § 401.14 (e), as applicable.

## 6. Protection of Reported Inventions

When inventions are reported and disclosed between the Parties in accordance with the provisions of this clause, the receiving Party agrees to withhold such reports or disclosures from public access for a reasonable time (presumed to be 2 years unless otherwise mutually agreed or unless such information is restricted for a longer period herein) in order to facilitate the allocation and establishment of the invention and patent rights under these provisions.

## 7. Patent Filing Responsibilities and Costs

(a) The invention and patent rights set forth herein will apply to any patent application filed and any patent obtained covering an invention made as a result of the performance of activities under this Agreement. Each Party is responsible for its own costs of obtaining and maintaining patents covering sole inventions of its employees; except that NASA and AD ASTRA may mutually agree otherwise, upon the reporting of any invention (sole or joint) or in any license granted, as to responsibilities and course of action to be taken to establish and maintain patent protection on such invention.

(b) AD ASTRA agrees to include the following statement in any patent application it files for an invention made jointly between NASA employees (or employees of a NASA Related Entity) and employees of AD ASTRA:

The invention described herein may be manufactured and used by or for the U.S. Government for U.S. Government purposes without the payment of royalties thereon or therefor.

## 8. Related Inventions

(a) For the purposes of this paragraph, a related invention is an invention related to the subject matter of this Agreement, but not made as a result of activities performed under this Agreement, that is covered by a patent application or patent owned by NASA or AD ASTRA. To the extent NASA related invention(s) are known and identified in paragraphs (b) or (d) below, upon request, and to the extent such related inventions are available for licensing, NASA may enter into negotiations with AD ASTRA for a license to such related invention(s) consistent with the requirements of 37 C.F.R. Part 404.

(b) At the time of execution of this Agreement, the Parties agree that the following inventions are related inventions:

"Not Applicable"



(c) Related Computer Software: Where a related invention in the form of computer software is provided by NASA to AD ASTRA, such software will be provided under a separate Software Usage Agreement. AD ASTRA agrees to maintain such software in confidence and use it only for carrying out AD ASTRA responsibilities under this Agreement. Unless AD ASTRA has entered into a license, consistent with 37 C.F.R. Part 404, for software provided under this Agreement, upon completion of activities under this Agreement, all copies of such software will be disposed of as instructed by NASA.

(d) At the time of execution of this Agreement, the Parties agree that the following software is related computer software that will be provided to AD ASTRA in accordance with paragraph (c) above:

"Not Applicable"

## ARTICLE 12. USE OF NASA NAME AND NASA EMBLEMS AND RELEASE OF GENERAL INFORMATION TO THE PUBLIC

### 1. NASA Name and Initials

AD ASTRA agrees the words "National Aeronautics and Space Administration" and the letters "NASA" will not be used in connection with a product or service in a manner reasonably calculated to convey any impression that such product or service has the authorization, support, sponsorship, or endorsement of NASA, which does not, in fact, exist. In addition, with the exception of release of general information in accordance with paragraph 3 below, AD ASTRA agrees that any proposed public use of the NASA name or initials (including press releases resulting from activities conducted under this Agreement and all promotional and advertising use) shall be submitted by AD ASTRA in advance to the NASA Assistant Administrator for Public Affairs or designee ("NASA Public Affairs") for review and approval. Review by NASA Public Affairs of the submitted materials shall be completed within a reasonable period of time following receipt thereof and approval shall be based on applicable law and policy governing the use of the NASA name and initials.

### 2. NASA Emblems

Use of NASA emblems/devices (i.e., NASA Seal, NASA Insignia, NASA logotype, NASA Program Identifiers, and the NASA Flag) are governed by 14 C.F.R. Part 1221. AD ASTRA agrees that any proposed use of such emblems/devices shall be submitted to NASA Public Affairs for review and approval in accordance with such regulations.

### 3. Release of General Information to the Public

NASA or AD ASTRA may, consistent with Federal law and this Agreement, release general information regarding its own participation in this Agreement as desired.

## ARTICLE 13. DISCLAIMER OF WARRANTY

Equipment, facilities, technical information, and services provided by one Party to the other under this Agreement are provided "as is." Neither Party makes an express or implied warranty



as to the condition of such equipment, facilities, technical information, or services, or as to the condition of any research or information generated under this Agreement, or as to any products made or developed under or as a result of this Agreement including as a result of the use of information generated hereunder, or as to the merchantability or fitness for a particular purpose of such research, information, or resulting product, or that the equipment, facilities, technical information, or services provided will accomplish the intended results or are safe for any purpose including the intended purpose, or that any of the above will not interfere with privately owned rights of others. NASA, the government and AD ASTRA and their respective "Related Entities" (as defined in Article 10 – 1(a) herein) and their respective employees shall not be liable for special, consequential or incidental damages attributed to such equipment, facilities, technical information, or services provided under this Agreement or such research, information, or resulting products made or developed under or as a result of this Agreement.

#### ARTICLE 14. DISCLAIMER OF ENDORSEMENT

NASA does not endorse or sponsor any commercial product, service, or activity. NASA's participation in this Agreement or supply of equipment, facilities, technical information, or services under this Agreement does not constitute endorsement by NASA. AD ASTRA agrees that nothing in this Agreement will be construed to imply that NASA authorizes, supports, endorses, or sponsors any product or service of AD ASTRA resulting from activities conducted under this Agreement, regardless of the fact that such product or service may employ NASA-developed technology.

#### ARTICLE 15. COMPLIANCE WITH LAWS AND REGULATIONS

The Parties shall comply with all applicable laws and regulations including, but not limited to, safety, security, export control, and environmental laws and regulations. Access by AD ASTRA to NASA facilities or property, or to a NASA Information Technology (IT) system or application, is contingent upon compliance with NASA security and safety policies and guidelines including, but not limited to, standards on badging, credentials, and facility and IT system/application access.

#### ARTICLE 16. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below and shall remain in effect for a period of four (4) years from the date of the last signature.

#### ARTICLE 17. RIGHT TO TERMINATE

This Agreement may be terminated at any time by mutual agreement of the Parties. AD ASTRA may unilaterally terminate this Agreement by providing at least sixty (60) calendar days advance written notice to NASA. NASA may unilaterally terminate this Agreement by providing at least sixty (60) calendar days advanced written notice to AD ASTRA. AD ASTRA and NASA will make reasonable efforts to avoid unilateral termination.



## ARTICLE 18. CONTINUING OBLIGATIONS

The rights and obligations of the Parties that, by their nature, would continue beyond the expiration or termination of this Agreement, e.g., "Financial Obligations", "Liability and Risk of Loss" and "Intellectual Property Rights-Data Rights," shall survive such expiration or termination of this Agreement.

## ARTICLE 19. TECHNICAL POINTS OF CONTACT

The following personnel are designated as the principal points of contact between the Parties in the performance of this Agreement.

### Technical Points of Contact

#### NASA Lyndon B. Johnson Space Center

Chimin Chang  
Payload Engineering Integration  
Mail Stop: OZ3  
2101 NASA Parkway  
Houston, Texas 77058-3607  
Phone: 281.244.7523  
Fax: 281.244.8958  
chi-min.chang-1@nasa.gov

#### Ad Astra Rocket Company

Dr. Tim Glover  
Director of Development  
141 W. Bay Area Blvd  
Webster, TX 77598-4111  
Phone: 281.526.0500  
Fax: 281.526.0599  
tim.glover@adastrarocket.com

## ARTICLE 20. DISPUTE RESOLUTION

Except as otherwise provided in the article of this Agreement entitled "Priority of Use," for those activities governed by 37 C.F.R. Part 404 under the article of this Agreement entitled "Intellectual Property Rights – Patent and Invention Rights," and those situations where a pre-existing statutory or regulatory system exists (e.g. under the Freedom of Information Act, 5 U.S.C. § 552), all disputes concerning questions of fact or law arising under this Agreement shall be referred by the claimant in writing to the appropriate person identified as the "Technical Points of Contact (POCs)". The persons identified as the "Technical Points of Contact (POCs)" for NASA and AD ASTRA will consult and attempt to resolve all issues arising from the implementation of this Agreement. If they are unable to come to agreement on any issue, the dispute will be referred to the supervisors of the POCs, or their designated representatives, for joint resolution. If the Parties remain unable to resolve the dispute, then the NASA signatory or that person's designee, as applicable, will issue a written decision that will be the final agency decision for the purpose of judicial review. Nothing in this section limits or prevents either Party from pursuing any other right or remedy available by law upon the issuance of the final agency decision.



## ARTICLE 21. MODIFICATIONS

Any modification to this Agreement shall be executed, in writing, and signed by an authorized representative of NASA and AD ASTRA. Any modification that creates an additional commitment of NASA resources must be signed by the original NASA signatory authority, or successor, or a higher level NASA official possessing original or delegated authority to make such a commitment. The follow-on agreements contemplated to be entered into between the Parties to facilitate the Project shall be considered modifications to this Agreement in accordance with this Article. Any terms in any modification to this Agreement shall take precedence over any conflicting prior terms including the terms contained herein.

## ARTICLE 22. MISHAP INVESTIGATION

In the case of a mishap or mission failure, the Parties agree to provide assistance to each other in the conduct of any investigation. For all NASA mishaps, AD ASTRA agrees to comply with NPR 8621.1, "NASA Procedural Requirements for Mishap Reporting, Investigating, and Recordkeeping."

## ARTICLE 23. LOAN OF GOVERNMENT PROPERTY

The Parties acknowledge that no government property shall be loaned by NASA to AD ASTRA under this Agreement. All loans of government property intended to support the development and commercialization of the VASIMR technology shall be made under and governed by the terms of the Space Act Agreement between the Parties, executed December 10, 2007 (SAA-AT-07-007).

## ARTICLE 24. ASSIGNMENT

Neither this Agreement nor any interest arising under it will be assigned by AD ASTRA or NASA without the express written consent of the officials possessing original or delegated authority to make such a commitment.

## ARTICLE 25. APPLICABLE LAW

U.S. Federal law governs this Agreement for all purposes, including, but not limited to, determining the validity of the Agreement, the meaning of its provisions, and the rights, obligations and remedies of the Parties.

## ARTICLE 26. INDEPENDENT RELATIONSHIP

This Agreement is not intended to constitute, create, give effect or otherwise recognize a joint venture, partnership, or formal business organization, or agency agreement of any kind, and the rights and obligations of the Parties shall be only those expressly set forth herein.



ARTICLE 27. SIGNATORY AUTHORITY

The signatories to this Agreement covenant and warrant that they have authority to execute this Agreement. By signing below, the undersigned agrees to the above terms and conditions.

NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION

AD ASTRA ROCKET COMPANY

BY: William H Gerstenmaier  
William H. Gerstenmaier  
Associate Administrator  
for Space Operations  
300 E Street SW  
Washington, DC 20546

BY: Franklin Chang Díaz  
Franklin Chang Díaz  
Chief Executive Officer  
141 W. Bay Area Blvd  
Webster, TX 77598-4111

DATE: 5 dec 2008

DATE: 8 dec 2008