



Lunar Cargo Transportation And Landing by Soft Touchdown (Lunar CATALYST)

Pre-Proposal Conference

Jan 27, 2014





- **Jason Crusan**, Director of Advanced Exploration Systems (AES), Human Exploration and Operations Mission Directorate (HEOMD)
- **Nantel Suzuki**, Robotic Lunar Lander Program Executive, AES, HEOMD (Lunar CATALYST Primary Point of Contact)
- **Greg Chavers**, AES Robotic Lunar Lander Development Project Manager (Lunar CATALYST Point of Contact for Proposed NASA Contributions)
- **Erin Mahoney**, AES Communications Manager, HEOMD (Teleconference Moderator)



- Provide an overview of the Lunar CATALYST Announcement, released on Jan 16, 2014, which seeks proposals to partner with NASA in the development of robotic lunar lander capabilities
- Address questions from potential respondents



- NASA will address questions during this teleconference to clarify the content of the Announcement
- Questions that require further assessment to address will be resolved as soon as possible after the teleconference, and the answers will be posted to the Lunar CATALYST website
(URL: <http://www.nasa.gov/lunarcatalyst>)
- Potential respondents may also submit questions in writing to the following email address: hq-lander@mail.nasa.gov
- NASA will not provide evaluations, opinions, or recommendations regarding any suggested approaches or concepts
- The Announcement and written answers posted to the Lunar CATALYST website take precedence over all verbal discussions, including this conference



- Background
 - Private investment in space transportation systems is increasing
 - Commercial lunar cargo transportation is a potential new area of opportunity that could provide services to both public and private customers and enable science and exploration missions
 - Per National Space Transportation Policy, NASA is "committed to encouraging and facilitating a viable, healthy, and competitive U.S. commercial Space Transportation Industry."
 - NASA has accumulated decades of technical experience relevant to lunar cargo transportation, most recently the Mighty Eagle and Morpheus projects
 - Sept 2010 - NASA initiated lunar data purchases via Innovative Lunar Demonstration Data (ILDD) contracts
 - July 2013 - NASA issued Request for Information (RFI) on partnerships for industry-led robotic lunar lander development; responses indicated significant interest by U.S. private sector
- Lunar CATALYST
 - Announced Jan 16, 2014
 - Purpose is to employ partnerships with the private sector to develop robotic lunar lander capabilities



- Enter into one or more **no-funds-exchanged Space Act Agreements (SAAs)** with U.S. private-sector partners
 - The number of SAAs will depend upon the strength of proposals and NASA's available resources
- Facilitate the development of robotic lunar landers that collectively deliver small (30 to 100 kg) and medium (250 to 500 kg) class payloads to the lunar surface using U.S. commercial launch capabilities
- Select partners that demonstrate a likelihood of successfully completing development of a commercially-viable lunar surface cargo transportation capability with achievable approaches for lunar lander development and realistic financial strategies to support development, demonstration and eventual commercial application
- Provide the following types of NASA resources:
 - Civil Servant Technical Expertise
 - Facilities
 - Equipment loans
 - Software
- Note: NASA does not currently have a requirement for commercially-provided lunar lander or lunar cargo transportation services



- Key Dates

Feb 10, 4pm EST	Proposed NASA Contributions forms due
Feb 28	NASA will certify viability of proposed NASA contributions and provide feedback to Respondents For forms received after the Feb 10 due date, NASA will provide feedback on a best-effort basis
Mar 17, 4pm EDT	Proposals due

NASA's intent is to announce selected partners by April, and to begin to execute SAAs by May 2014

- Eligible Participants

- U.S. private-sector entities are eligible to submit proposals. NASA will not consider proposals that do not include a domestic entity as the lead proposer.
 - U.S. federal, state, and local government entities, including National Laboratories, Federally Funded Research and Development Centers, and NASA Centers are not eligible to participate in proposals
- A "blackout" period of communication is in effect until SAAs are awarded. All questions shall be directed to Nantel Suzuki (hq-lander@mail.nasa.gov) (Exception: Questions regarding proposed NASA contributions shall be directed to Greg Chavers (greg.chavers@nasa.gov)).



- Cover Page, Title Page
- Section I: Executive Summary
- Section II: Proof of Eligibility
- Section III: Capability Performance Goals
 - amount of payload mass to be delivered to the lunar surface;
 - areas of the lunar surface that can be reached (e.g. low-latitudes, poles, far side);
 - degree of operational autonomy;
 - degree of precision landing capability;
 - capability to land on hazardous terrain;
 - ability to survive or operate in lunar nighttime thermal conditions;
 - mission duration/longevity;
 - payload interfaces (e.g. communications, thermal, and power);
 - payload deployment capability;
 - compatibility with various payload types (e.g. rovers and lunar ascent vehicles); and
 - compatibility with U.S. commercial launch services
- Section IV: Technical Approach
 - a schedule with key development gates and performance milestones representing the progress of significant technical and financial events in the Respondent's effort.;
 - technical risks and mitigation plans;
 - testing and demonstration plans;
 - key resources required (human and physical), including those already developed or acquired; and
 - significant external technical dependencies, including a general description of the proposed NASA contributions (details to be listed in a separate attachment).



- **Section V: Financial Plan Supporting Development**
 - all sources of equity and debt financing, and sources of revenue;
 - business partnerships required;
 - level of current and planned financial commitments supporting the proposed efforts, including any third party financing required; and
 - business plans for existing efforts and how they will contribute to this proposed effort;
- **Section VI: Commercialization Strategy (long-term plan for operating a sustained and profitable commercial enterprise after capability development)**
 - the long-term business and market strategy for providing lunar cargo transportation services;
 - non-Government market potential for providing robotic landers or lunar transportation services and what products and services will be provided;
 - a roadmap of essential activities to bring the product to market beyond the development phase, including any reliance on U.S. Government activities; and
 - the nature of missions and customers for the proposed services and how their requirements will be met, including projected number of missions and anticipated growth rates.



Attachments

- **A. Proposed NASA Contributions**
 - Communications with NASA for the purpose of confirming the viability of proposed NASA contributions may continue during the blackout period, but must be limited to the following Point of Contact: Greg Chavers. During the competition period, Respondents may not request, and NASA will not provide, assistance in preparing proposals.
Respondents shall provide the following information:
 - A list of proposed NASA contributions to development of the robotic lunar lander capability. Respondents should submit Proposed NASA Contributions forms to Greg Chavers
 - NASA certification letter. NASA will assess the list of proposed NASA contributions, and if appropriate, will provide a certification letter. This letter shall be included in the submitted proposal
- **B. Supporting Financial Information**
 - Provide supporting information, consistent with the business plan and long-term business and market strategy, including:
 - An Income Statement for the years 2014-2019.
 - Investor term sheets and contact information for financing sources.
 - Letters of support or intent from non-NASA customers
- **C. Resumés**
- **D. Draft Space Act Agreement**
 - The Respondent shall provide a proposed CATALYST SAA using the Draft Space Act Agreement template included in the Announcement. Any proposed changes to the Draft Space Act Agreement template by the Respondent shall be highlighted and rationale provided for the proposed change

Lunar CATALYST Capability Development

APPENDIX B: DATA TEMPLATES

Use of the following templates is required in order to facilitate a streamlined and equitable evaluation process.

Template 1: Proposed NASA Contributions

Complete Template 1 to identify any NASA services, facilities, equipment (loans), or software requested by Respondent. Provide a description of the services, facilities, equipment, or software included in the proposal, and an estimate of when the NASA resource is needed (round to the month).

Template 1

Proposed NASA Contributions	
Brief Description of Proposed Service, Facilities, Equipment, or Software	Timing of Need
Ex. Thermal Vacuum Chamber – xx days	Oct – Dec 2016

Template 2: Income Statement

Complete Template 2 to provide a year-by-year summary of anticipated revenues and expenses, consistent with the business plan.

Template 2

Income Statement						
Fiscal Year	2014	2015	2016	2017	2018	2019
Revenue						
Cost of Goods Sold						
Gross Profit						
Operating Expenses						
Research & Development						
Sales, Marketing, Bus Dev						
Other						
Total Operating Expenses						
Operating Income						



- NASA reserves the right to select for negotiations all, some, or none of the proposals it receives in response to this Announcement
- Compliance Check
 - Proposals will be screened to evaluate whether they comply with the eligibility criteria and proposal requirements. Proposals that do not comply may be declared noncompliant and rejected without further review
- Evaluation
 - A Participant Evaluation Panel will evaluate proposals according to pre-defined evaluation criteria. NASA may request clarification of a specific point or points in a proposal. Such a request and the Respondent's response shall be in writing.
 - After evaluating each proposal, NASA will compare the results as part of a tradeoff analysis. The purpose of this tradeoff analysis is to select one or more approaches that best meets Lunar CATALYST's objectives.
 - NASA may select a partner(s) based on initial proposal submissions. At its discretion, NASA may enter into due diligence with those companies whose proposals were most favorably evaluated. Due diligence may involve questions about the business, technical, and financial aspects of the proposals, requirements for NASA involvement, and any exceptions made to the draft SAA. If due diligence is conducted, proposers will be provided the opportunity to submit proposal updates.
- Selection and Award
 - Upon selection, final Space Act Agreement terms and conditions will be negotiated. Activities under the partnership will commence after the parties execute the SAA.



- Evaluation Criteria

- Factor 1: Capability Performance Goals

The Government will evaluate the suitability of the technical capability proposed to be developed for consistency with the commercial opportunities identified in the proposal.

- Factor 2: Technical Approach

The Government will evaluate the overall merit, rationale, feasibility, quality of human and technical resources, and suitability of the proposed effort or concept and its relevance to providing robotic lander services to the Moon. Highest priority will be placed on a technical approach or concept that will provide a technically credible robotic lunar lander capability.

- Factor 3: Financial Plan Supporting Development

The Government will evaluate the overall merit, rationale, and feasibility of Respondent's Financial Plan Supporting Development

- Factor 4: Commercialization Strategy

The Government will evaluate the overall merit, rationale, and feasibility of Respondent's Commercialization Strategy.

- Factor 5: Draft Space Act Agreement

The Government will evaluate any exceptions to the draft Space Act Agreement against the potential impact to the Government's objective and the potential enhancement of future commercial opportunities.

In addition, NASA reserves the right to assess information outside the proposal as it relates to the evaluation criteria stated above.



Thank you for your participation today

This presentation will be posted to the
Lunar CATALYST website:

<http://www.nasa.gov/lunarcatalyst>

Please submit questions about this Announcement to:

hq-lander@mail.nasa.gov