



Advanced Reusable Space Transportation Technologies Research NRA 8-21

Offerors Briefing

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NASA Marshall Space Flight Center



Purpose of Briefing

- **Describe NASA Research Announcement 8-21**
- **Allow for Questions and Answers**

Contents of NRA Takes Precedence over Briefing



■ Selection Official

- Rick Bachtel, NASA MSFC

■ Procurement Lead

- James Bailey, NASA MSFC

■ Advanced Reusable Technologies Manager

- Uwe Hueter, NASA MSFC

■ RLV Manager

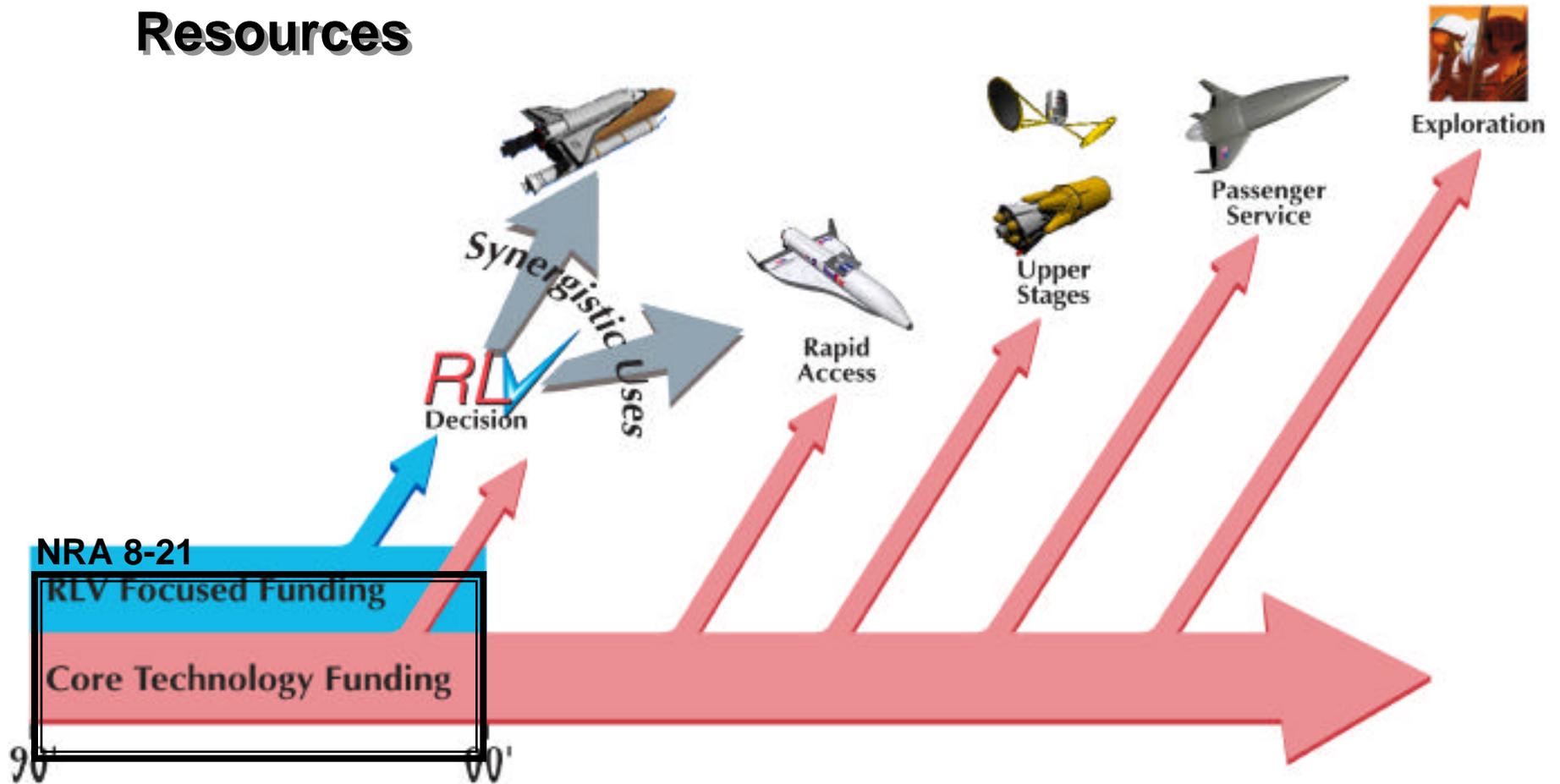
- Steve Cook, NASA MSFC



Timeframe: Near and Long Term Investments

Maximize Limited Resources

Future Transportation Needs





Overview

- **Joint RLV / ASTP Effort for Technology Development and Demonstration**
 - RLV Focused activities are “end of the decade decision supportive”
 - Core (ASTP) activities support wide range of reusable space transportation needs, including a next generation RLV

- **Limited to reusable technologies for future transportation systems**
 - Exception - Technologies for orbital transportation systems (upperstages)

- **NRA allows for both ground and flight experiments**
 - Future-X not part of NRA 8-21

- **System payoffs/customers must be defined for all activities**

- **Activities must be product focused (not paper studies)**

- **Opportunities open to industry / academia / government laboratories**



RLV Focused **(Near-Term Focus)**

- **Supports a decision around the end of the decade on a next generation reusable launch vehicle**
 - Significantly reduces NASA's access to space costs
 - Focus on high risk areas associated with an operational RLV in the 2005 timeframe
- **Open to all RLV concepts and technologies**
 - Earth to LEO
 - Orbital transfer

Core **(Long-Term Focus)**

- **Continuous effort linked to a wide range of near and long term transportation needs**
- **Establishes and maintains a strong, stable core capability**
- **“Pipeline” of demonstrations**
- **Excludes technologies unique to orbital transportation**
- **Balanced investment:**
 - Airframe Systems
 - Propulsion Systems



■ Airframe systems (TA-1)

Examples:

- Cryogenic tanks
- Structures and materials
- Thermal protection systems
- Integrated health management systems
- Avionics and power
- Guidance, navigation and control
- Ground and payload operations
- Flight and mission operations
- Analytical and design tools



NRA Technology Areas (cont'd)

■ Propulsion systems (TA-2)

Examples:

- Main engine systems, components and subsystems
- Propellants
- Lines, ducts and valves
- High temperature materials
- Lightweight materials
- Auxiliary propulsion components and subsystems (e.g., RCS, OMS)
- Propulsion related health management systems
- Analytical and design tools

■ Other Related Technologies (TA-3)



Available Budget (Planning Only)

\$M	FY98	FY99	FY00	Total
RLV Focused- Basic	\$3.9	\$14.5	\$15.7	\$34.1
<i>RLV Focused- Enhanced</i>		<i>TBD</i>	<i>TBD</i>	<i>TBD</i>
Core-Propulsion		\$3.0	\$9.8	\$12.8
Core-Airframe		\$3.5	\$9.5	\$13.0

- Funding provided directly to offerors
- Funds required to pay for charges relating to the performance of Government responsibilities under resulting grants, cooperative agreements or contracts



Schedule

- **Cycle 1 Proposals Due** **May 1**
- **Cycle 1 Negotiations (@ MSFC)** **May 26 – June 5**
- **Cycle 1 Award** **June 9**
- **Cycle 2 Proposals Received** **October 15**



Proposal Instructions



**Cycle 1 is for only RLV Focused
Technologies**

**Cycle 2 is for both RLV Focused &
Core Technologies**



Potential Award Instruments

- **Multiple awards are anticipated**

- **Several instruments may be used to execute this NRA:**
 - Contracts

 - Grants

 - Cooperative Agreements



Cooperative Agreement Cost Sharing

NASA Contribution

- Funds provided to Industry Partner
- Funds provided to Government Installations for Support Tasks

Industry Contribution

- Funds provided by Industry
 - Cash, IRAD, In-Kind

NASA Cooperative Agreement Policy Requires a 50:50 Ratio



Proposal Instructions - Mechanics

- **Each offeror is encouraged to submit only one proposal**
- **Four Sections**
 - I. Airframe Systems (TA-1)
 - II. Propulsion Systems (TA-2)
 - III. Other (TA-3)
 - IV. Other Information Requested by the NRA (cost, etc.)
- **Page count: limited to 20 pages for each section (I, II and III)**
 - See NRA for details
- **Submit 25 paper copies plus reproducible and signed original**
- **Submit an electronic version in Word / Excel on a Zip or Jaz**



Proposal Instructions - Technical

- **Provide a technology development and insertion roadmap**
- **Within each Technology Area, offerors shall submit stand alone tasks**
- **Prioritize tasks across and within Technology Areas**
- **Provide for EACH TASK proposed under a technology area:**
 - Description of the responsibilities and tasks to be accomplished
 - Identification of potential customers for the technology
 - Identification of potential operational system payoffs from incorporation of the technology.
 - Technical approach for all appropriate disciplines
 - Test plan for all major tests
 - Integrated task schedule including milestones, key products and off-ramps
 - Plans for defining, measuring, evaluating, and reporting progress toward success over the course of the task (measured annually).
 - Major challenges to maturing the technology
 - Description of potential follow-on activities after FY00
 - A task cost breakdown
- **Preliminary description of potential additional RLV focused technology tasks (RLV - Enhanced) - Cycle 1 only**



Government Laboratory Support

- **Substantial involvement by Government Laboratories is required by policy for cooperative agreements**
- **Government installations are available to all offerors to support technology development**
 - Personnel, facilities, etc.
- **Letter of Commitment from Installation Director or designee is required**
- **Support task funding requirements must be reimbursed out of the NRA 8-21 budget**
 - Includes any required civil service overhead charges, facility modifications, facility use, support contractors, etc. set by each center
 - NRA funds may not be used to cover the full cost of civil servant labor or travel
 - All reimbursements will be made internal to the Government
- **Proposals will not be evaluated on the amount of tasks they make available to Government installations**

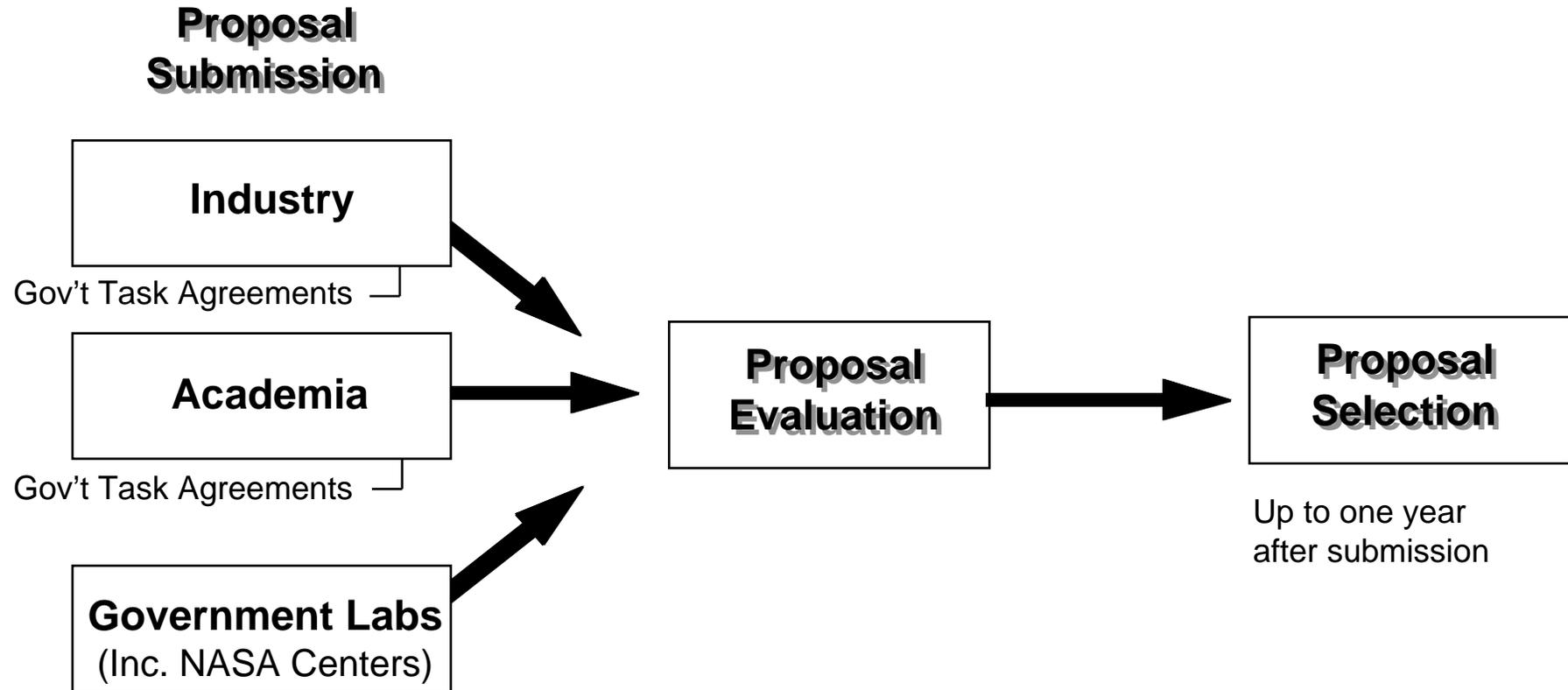


Government Installation Points of Contact

- **Ames Research Center (ARC)** **Dan Bencze**
- **Dryden Flight Research Center (DFRC)** **John Hicks**
- **Jet Propulsion Laboratory (JPL)** **Ken Russ**
- **Johnson Space Center (JSC)** **Harry Erwin**
- **Kennedy Space Center (KSC)** **Warren Wiley**
- **Langley Research Center (LaRC)** **Sharon Welch**
- **Lewis Research Center (LeRC)** **Scott Graham**
- **Marshall Space Flight Center (MSFC)** **Steve Stoyanof**
- **Stennis Space Center (SSC)** **Patrick Scheuermann**
- **USAF Research Laboratory** **Capt. John Anttonen**



Selection Process (each cycle)



Blackout Conditions Exist During Selection Process



Evaluation Factors

■ Relevance to NASA's objectives

- RLV Focused
 - Traceability of the technology to a next generation RLV concept including the potential system payoffs to an RLV.
 - Synergism with other advanced space transportation technology needs (e.g., Shuttle upgrades, military spaceplane, etc.)
- Core
 - Traceability of the technology to future space transportation needs, including the potential system payoffs to future systems.
 - Applicability of the technology to a broad range of future space transportation needs
 - Enable a strong core technological capability to enable U.S. leadership in low cost reusable space transportation
- Restrictions on technology produced
- Deviations to the model Cooperative Agreement (if applicable)

■ Intrinsic merit

- Technical merit, unique and innovative methods / approaches / concepts
- Offeror's capabilities, experience (past performance), facilities, techniques
- Key personnel qualifications, capabilities and experience
- Standing among similar proposals and/or evaluation against the state-of-the-art

■ Cost

- Realism and reasonableness (inc. degree of sharing by offeror)



Negotiations with Selected Offerors

- **Teams selected for negotiations will be notified after source evaluation committee briefs the source selection official**
- **All or part of a proposal may be selected for negotiations**
- **Negotiations will be conducted in parallel with multiple offerors**
- **Industry / academia teams should bring appropriate technical and procurement staff to MSFC for negotiations**
 - All negotiations will be completed within two weeks at MSFC
 - Plan to SIGN instruments with offerors at MSFC



NASA NRA Management

Contracts, cooperative agreements, etc. will be managed by individual centers. Examples:

■ **Airframe systems (TA-1)**

- Cryogenic tanks (MSFC)
- Structures and materials / integrated demonstrations (LaRC)
- Thermal protection systems (ARC)
- Avionics / GN&C / Power (MSFC)
- Ground and payload operations (KSC)
- Flight and mission operations (JSC)

■ **Propulsion systems (TA-2)**

- Main engine systems, components and subsystems (MSFC)
- MPS (lines, ducts, valves, etc.) (MSFC)
- Auxillary propulsion components and subsystems (MSFC)
- High temperature/light weight materials (LeRC)

■ **Other (TA-3)**

- Assigned as appropriate



NASA Policy on Foreign Participation

- **Foreign participation must provide clear net benefits to the achievement of the program's technical and business objectives.**
- **Federal funds may be used for manufacture or acquisition of flight-ready foreign component technology, but may not be used for foreign-based development of foreign technology, unless specifically exempted by the NASA Administrator.**
- **Incorporation of foreign technology must not threaten the successful execution of the program, both in its developmental and operational phases.**
- **Due consideration is given to fostering U.S. competitiveness and safeguarding national security interests throughout the life of the program.**
- **Close consultation is maintained with NASA and other appropriate U.S. Government agencies on all aspects of foreign participation.**



■ Internet location of documents:

- NRA 8-21and Offerors Briefing:
 - <http://nais.msfc.nasa.gov>

■ Breakout rooms available today (signup posted outside rooms)

- 4202 / Room 103
- 4202 / Room 212



Cycle 1 Proposals
Due On
May 1, 1998