

Question and Answer Log
Next Space Technologies for Exploration Partnerships-2 (NextSTEP-2)
ANNOUNCEMENT

As of May 19, 2016

BACKGROUND:

In April 2016, NASA issued a competitive announcement requesting U.S. private sector proposals to partner with NASA on the development of critical technologies needed for the next steps in deep space human exploration. This effort, is a follow-on to a Broad Agency Announcement (BAA) released in October 2014 called the Next Space Technologies for Exploration Partnerships (NextSTEP) and is referred to as NextSTEP-2. This BAA is an omnibus BAA with Appendices being released to solicit for specific areas of research. The initial solicitation, Appendix A, is seeking architecture concepts and ground prototype habitation systems for deep space missions.

QUESTIONS:

POLICY - STRATEGY

Q1: Are innovative approaches to on-orbit demonstrations during the Phase 1 timeframe of interest to NASA?

A: Yes, But, please refer to Section 2 of Appendix A for the specific objectives of this particular solicitation.

Q2: Could you clarify the meaning of the fourth bullet (objective)? [Identify commercial capability development for LEO that intersects NASA long duration deep space habitation requirements along with any potential option to maximize the leveraging of commercial LEO advancements towards meeting NASA long duration deep space habitation needs.]

A: An important part of NASA's strategy is to stimulate the commercial space industry while leveraging those same commercial capabilities through public-private partnerships and potentially future contracts to deliver mission capabilities at lower costs. The government wishes to identify capabilities developed through these activities that benefit both commercial LEO advancements and NASA's long duration deep space habitation needs.

Q3: What role does this effort play in NASA's strategy to send humans to Mars?

A: The NextSTEP activities are developing the concepts and technologies needed for development of the deep space, long duration habitation capabilities that would be required for a journey to Mars. These efforts include development and refinement of an evolvable, modular architecture and ground prototypes that can be tested to validate the concepts and technologies. Eventually, flight systems will be built based on these ground prototypes that will be used to validate the deep space capabilities in the proving ground around the moon and beyond.

Q4: What is the relationship of this program to the SLS and Orion programs, which are supposed to take humans into deep space?

A: The Orion spacecraft and SLS are NASA's first major components for human presence in deep space. With the transportation system progressing toward a maiden flight in 2018, NASA is now looking toward development of deep space habitation capabilities – the next major component of human space exploration beyond low-Earth orbit. In addition to Orion, NASA requires these deep space habitation capabilities to enable long-duration missions of up to 1000 days.

Q5: What is the relationship of this program to the Asteroid Redirect Mission?

A: If elements of the overall habitation capability are available when the ARRM brings back asteroid material to cislunar space, we will be able to perform EVAs out of the habitat capabilities instead of only with Orion. This is one of the potential design reference missions included in Appendix A.

Q6: There is already both a Commercial Crew program and Orion developing crewed space systems; why is another crewed system required?

A: Although both the Commercial Crew program and Orion are providing crewed space transportation, the system capabilities support different missions. The Commercial Crew program is specifically designed for short duration transport of humans to low-Earth orbit. The Orion spacecraft provides transportation for humans beyond low-earth orbit and will have a capability of sustaining a crew of 4 for 21 days in deep space and returning them safely to Earth. The systems being developed and tested by NextSTEP when combined with Orion, will provide an evolvable capability for longer duration missions in deep space with potential initial missions in the proving ground and beyond.

Q7: Will this habitat system be like another ISS but in cislunar space instead?

A: No. ISS has been continually crewed since 2000 in low earth orbit for conducting continuous research across a wide range of disciplines. These habitats will not be initially continuously crewed and will need to be able to operate autonomously without crew onboard. Any initial habitats will also have smaller mass/volume due to the primary purpose being for support to crewed missions and not a wide range of research requiring multiple and complex research facility capabilities. These habitats will also be designed to survive the deep space environment (e.g.. Higher radiation, more efficient regenerative ECLSS, Improved exercise systems, more comprehensive medical capability, long-duration food supplies) and work with intermittent and higher communication delays.

Q8: Is the focus of the NextSTEP-2 BAA on a habitat for Mars or nearer term proving ground missions around the Moon?

A: The focus of Appendix A activities is to develop evolvable, modular architecture concepts based on common interfaces and standards, and ground prototypes to test out these concepts for deep space. There are multiple approaches that could be valid in achieving this final goal of long duration deep space habitation capabilities. Many of the approaches could include evolvable and incremental build up of habitation capabilities that could benefit from early testing in cislunar space to validate the capabilities needed for the long-duration

missions. In addition, NASA is looking to reach long duration deep space habitation objectives while leveraging available industry existing or planned capabilities in LEO for commercial habitation in support of commercial space stations. NASA is seeking concepts and approaches that lead to the final objective but is not dictating the approach to getting to that objective.

Q9: What are the missions that these habitats will execute?

A: The early delivery of any short duration habitation capabilities as an initial step towards long duration deep space cislunar habitation should be evolvable to the full capability required for Proving Ground Phase 2. Additional activities that may benefit from new habitation capabilities include:

- Long Duration Exploration Systems Testing
- Automation, Tele-operations, and Robotics
- Human Assisted Sample Return beyond the ARCM
- In Situ Resource Utilization (ISRU) Demonstration Missions
- Human Research in Deep Space
- Logistics Support
- General Science
- Deep space long duration (e.g., Mars) spacecraft assembly, refurbishment and validation

Q10: Under the background section of Appendix A, there is a list of additional activities that may benefit from new habitation capabilities. What might be an example of Human Assisted Sample Return beyond the ARCM?

A: There are currently draft mission concepts for both lunar and Mars sample returns to cislunar space that could be enabled using crewed systems for the final return of samples to Earth.

Q11: Why is NASA soliciting industry-built habitation concepts? Why can't NASA build its own habitation?

A: An important part of NASA's strategy is to stimulate the commercial space industry while leveraging those same commercial capabilities through public-private partnerships and potentially future contracts to deliver mission capabilities at lower costs. NASA is looking to reach long duration habitation objectives while leveraging available industry existing or planned capabilities in LEO.

Q12: Why must the habitation concepts be designed for cislunar space? Why not Mars?

A: Habitation concepts will be designed for the deep space environment enabling them to operate around the moon as well as surviving the deep space environment in the vicinity of Mars. Cislunar space is the location NASA plans to validate these capabilities before departing on long duration mission to Mars.

Q13: Why does NASA require the performers to commit their own resources to the development designs and prototypes?

A: NASA is looking to reach long duration habitation objectives while leveraging available industry existing or planned capabilities in LEO.

Q14: Why must the concepts support commercialization in low-Earth orbit if the end goal is cislunar space or Mars?

A: NASA is looking to reach long duration habitation objectives while leveraging available industry existing or planned capabilities in LEO. NASA plans to transition from LEO operations with the International Space Station into deep space missions. To enable that transition NASA is encouraging the creation of supply and demand markets for LEO.

Q15: What is a prototype cislunar habitat?

A: The NASA Procedural Requirements NPR 7120.8 definition of a proto-type is as follows: "The proto-type unit demonstrates form, fit, and function at a scale deemed to be representative of the final product operating in its operational environment. A subscale test article provides fidelity sufficient to permit validation of analytical models capable of predicting the behavior of full-scale systems in an operational environment."

Q16: When will the first flight of a cislunar habitat occur? When will the 1000 day mission occur?

A: NASA envisions that initial cislunar missions could occur as soon as the early to mid 2020's. NASA has not specified a precise date for the mission to the vicinity of Mars. The reference in Appendix A to 1000 days is representative of the types of duration such missions could potentially last.

Q17: How long will the cislunar missions last? (what is the duration of the missions?)

A: Mission durations may range from a few days to more extensive periods for a long-duration shakedown mission to complete the validation of the habitation and transportation capabilities.

Q18: Has NASA specified specific requirements for these cislunar habitats?

A: NASA is employing a rapid prototyping development activity where we build, test, and repeat with refinements. Requirements will be further refined based on validation of the concepts developed and tested in earlier cycles (such as this Phase 2 effort). This approach will greatly reduce system development costs. During this Phase 2 effort a significant portion of the effort will also be in the development of standards and common interfaces. These will drive future requirements for habitation capabilities.

Q19: What is the funding?

A: Please refer to the Appendix A Section 6.3.

Q20: What role are international partners playing in this development? (or Is there a role for international partners in this activity?)

A: At the end of Phase 2, the acquisition for flight elements will be determined based on these this activity as well as ongoing international partner studies. In addition, international entities may participate as team members in the Phase 2 activities. Please refer to the omnibus BAA and Appendix A Sections on eligibility.

Q21: How will the cislunar habitats be launched?

A: Proposers are instructed to define the launch requirements for their deep space habitat architecture concept. Appendix A, Section 2 defines some of the launch options.

Q22: There are several different specifications for SLS payload capability. Can you clarify what the SLS payload capability will be?

A: The currently envisioned SLS payload capabilities are described in the Virtual Industry Forum presentation posted at www.nasa.gov/nextstep

Q23: Will all four currently awarded Habitat System Phase 1 contracts continue into Phase 2?

A: Proposals from the current Phase 1 contractors will be evaluated using the same criteria as proposals submitted from this BAA.

Q24: How much funding was spent on habituation under NextSTEP-1? The release for the selections stated that the seven NextSTEP habitat projects will have initial performance periods of up to 12 months, at a value of \$400,000 to \$1 million for the study and development efforts, and the potential for follow-on phases to be defined during the initial phase.

A: Phase 1 Habitat area contract values:

4 Habitat Contracts:

Bigelow Aerospace:	\$745,160
Boeing:	\$1,003,256
Lockheed Martin:	\$982,039
Orbital ATK:	\$999,998

3 ECLSS Contracts:

Dynetics:	\$998,114
Orbital Technologies:	\$600,000
UTC Aerospace Systems:	\$824,829

ACQUISITION

Q25: Reference NNH16ZCQ001K-Habitat, Section 4.2.1.2 Deliverables. The last deliverable listed states, “The contractor shall develop a proposal for potential follow-on work containing a SOW, schedule/milestones, deliverables, and estimated price.” Please clarify NASA’s intent with respect to this deliverable. Is this deliverable intended to be a firm offer submitted under the Phase 2 contract?

Does NASA intend on releasing a BAA solicitation for NextSTEP Phase 3 containing specific requirements, proposal instructions and evaluation criteria for offerors to propose against?

A: Yes, a proposal for Phase 3 shall be a deliverable offered on the Phase 2 contract with an associated milestone and fixed price. Detailed guidance for Phase 3 proposals will be provided during execution of the Phase 2 activities.

Q26: This is a request for clarification on BAA Appendix A page 8, paragraph 4.1.1.5, Technical Approach, 5th bullet. Is the offer to include an end-to-end development schedule and estimated price for developing protoflight units and include it in this proposal submittal, or is the expectation that this be delivered later under NextSTEP-2 contract scope?

A: The proposal should provide an overview of the offeror's end-to-end development schedule with estimated price for follow on phases developing and deploying any additional prototype(s), engineering unit(s), and/or operational flight unit(s) to reach the end goal. An objective to be accomplished during the Phase 2 contract scope is to further develop and refine the detailed buildup and deployment approach of the evolvable, modular architecture, functional allocation options, standards and common interfaces.

Q27: Per the Phase 1 contract, the Phase 2 proposal constitutes a delivery with Limited Rights access. Since our Phase 2 proposal will include financial data that is considered proprietary, how will NASA protect Contractor financial data to be provided as part of our Phase 2 proposal?

A: Since the Phase 2 proposal is a proposal product, the instructions for markings contained in the "Guidebook for Proposers Responding to a NASA Funding Announcement." would apply. See reference 1 on page 22 of this BAA for a link to this Guidebook. Paragraph (c)(2) of Appendix B of the Guidebook provides instructions regarding the submittal of proposals that contain proprietary and/or financial information. Specifically, offerors should include the following notice on the title page of the proposal:

"Notice Restriction on Use and Disclosure of Proposal Information

The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the Offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal the Government shall have the right to use and disclose this information (data) to the extent provided in the contract (or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction."

Q28: The last paragraph in NextSTEP-2 BAA Section 2.6 says NASA anticipates award recipients will be required to archive all as-accepted manuscripts in the National Institute of Health PubMed Central. Since Appendix A does not mention or contradict this requirement, are we to assume it applies? If it does apply, please provide details (provisions, terms and conditions, and instructions) for complying with this requirement so we may account for it in our proposal.

A: This requirement does not apply to Appendix A.

Q29: Appendix A Habitation Systems, Section 4.1.1.8 Intellectual Property refers to Section 2.3 Intellectual Property, however Section 2.3 does not exist in Appendix A, nor the Omnibus BAA. We assume that the correct reference is Section 2.7. Please clarify.

A: Yes, please refer to the Omnibus Amendment 1, Section 2.7 "Intellectual Property Developed under an Award".

Q30: Appendix A Habitation Systems, Section 4.2.1.4 states "The contractor shall include an option for a priced sub-CLIN to provide potential support for shipping of selected modules to a NASA center." Please clarify the site where the NASA testing is anticipated to occur.

A: The location for NASA testing has not been determined. NASA will make appropriate modifications to contracts as required once the shipping location is defined.

Q31: Appendix A Habitation Systems, Section 4.1.1.9 states "For proposals exceeding \$750K, fully certified cost or pricing data will be required." Why is submission of cost or pricing data required when use of Broad Agency Announcements (BAA) are considered a competitive procedure under FAR 6.102?

A: The contracts awarded from BAAs are too different from each other to qualify for the exception for "adequate price competition" in section 15.403-1(b) of the Federal Acquisition Regulation (FAR). Therefore, certified cost or pricing data will be required.

Q32: Does NASA know what the contract type for Phase 3 is expected to be? Is it a FFP milestone based contract or something else?

A: No. NASA has not coordinated an approved contract strategy for Phase 3.

Q33: Appendix A Habitation Systems, Section 3.2 Corporate Resources states "CR may be prior investments made within one year prior to submission of the proposal." Omnibus BAA Section 11.2.5 Corporate Resources states, "For most research efforts, offerors will be required to show a specified amount of corporate contribution, made within the last five years, that is directly relevant to the proposed overall effort." Please clarify the look back period for partner contribution.

A: As defined in the Omnibus BAA Scope: "In cases of contradictions between texts, individual Program Elements take precedence over this Summary of Solicitation, and this Summary of Solicitation takes precedence over the Guidebook." The applicable period of prior investment allowed in Appendix A is specified in Section 3.2 as one year.

Q34: Appendix A Habitation Systems, Section 4.2.1.6 GFP/GFE/NASA Subject Matter Expertise states "Offerors may request access to Government facilities or Government services in their proposals." Will the government provide a Points of Contact list for the NASA Centers?

A: No.

Q35: Industry Forum: Can you provide a list of attendees?

A: NASA did not pre-coordinate or notify industry forum attendees that they would be listed. Therefore, a list of the forum attendees cannot be released. FedBizOpps.gov has a feature to list interested vendors associated with the posting.

Q36: Teaming. Are there any limitations to teaming scenarios.(i.e. restrictions to proposing teaming with NASA/JPL/Swampworks, etc.). Can you provide further clarification on the teaming structure (ie. institutional /design/ business leads serving as Prime contractor)?

A: Refer to Section 3 of the Omnibus BAA and Section 3.1 of Appendix A for information on eligibility. Section 4.2.1.6 of Appendix A describes how offerors may propose access to Government facilities, equipment or services in the conduct of their proposed activity. Offerors should note that Reimbursable Space Act Agreements will not be used in conjunction with this activity to access NASA resources. As described in responses to other questions, both the contractors currently awarded for Phase 1 and offerors for Appendix A are responsible for their teaming arrangements.

Q37: Requests for Information. Can the proposed system or subsystem specify technology currently under development by NASA or affiliated partners? If so what are the limitations to request information pertaining to the development of integrated systems.

A: The limitations to request information depend upon whether the information is for use in a proposal for this BAA or will be part of the proposed development effort during the period of performance. The limitations also depend upon the affiliation of the partner. For use of or access to NASA or other Government resources, refer to Section 4.2.1.6 of Appendix A.

Q38: Does a respondent to the BAA need to bid all of the identified categories of capabilities (habitat, service module, node/airlock, and logistics) to be considered?

A: No. The categories of capabilities are notional and differing architecture concepts may capture those functions in different combinations. The focus of Appendix A activities is to develop evolvable, modular architecture concepts based on common interfaces and standards, and ground prototypes to test out these concepts for deep space. There are multiple approaches that could be valid in achieving this final goal of long duration deep space habitation capabilities. Many of the approaches could include evolvable and incremental buildup of habitation capabilities that could benefit from early testing in space to validate the capabilities needed for the long-duration missions. For Appendix A, the focus is on full size ground prototype habitation systems. Please refer to the specific objectives listed in Appendix A Section 2.1.

Q39: In section 4.1.1 Proposal Format and Contents of the BAA Appendix A, it states "A page is defined as one side of a sheet, 8 ½" x 11" with at least one-inch margins on all sides, using not smaller than 12-point font, with the exception of tables and figures, which may use 8-point font." Does this preclude the use of foldouts?

A: The proposal may use foldouts on a limited basis, but only when warranted for oversize tables or figures that cannot be adequately represented on a standard sheet. Foldouts will be counted as two pages.

Q40: We have not participated in the 2015 round of NextSTEP. Therefore we do not know how the Phase 1 results are.

(1) For 2016 solicitation, are we to propose architecture design and system that conform to the system concepts being developed in Phase I study? If so, how do we know the results of Phase I in time for the 2016 round of solicitation?

A: Each Phase 1 Contractor has developed their own system concept. The same is being asked for offerors for Appendix A. Section 2.1 of Appendix A states “We understand that respondents may not have complete access or understanding of all NASA requirement information and feedback from subject matter experts so early milestones in proposals for this Appendix may include validation of concepts relative to NASA’s long duration deep space habitation system strategy.”

(2) The system technology we plan to propose is within the realm of ECLSS which was mentioned in 2015 solicitation. Is this topic still relevant in 2016 solicitation?

A: Unlike the original NextSTEP BAA Habitat thrust which allowed for subsystems, this solicitation is focused on complete habitat systems. Please refer to Appendix A Section 2.1 which states: “NASA is seeking proposals to provide complete deep space long duration architecture designs (including standards, common interfaces, and testing approach) and the development of full size, ground prototype units no later than 2018.”

(3) Are we to tailor our proposal as a part of Habitat System which is being developed in Phase 1 (2015), or we can propose an enabling technology independent of the 2015 study?

A: Please refer to the response in the question above (2).

Q41: Can major systems suitable for integration into the Habitat Module by NASA or others (e.g. Onboard Medical Capabilities, Environmental Monitoring, Water Recovery) be proposed as a standalone responses and be awarded under NextSTEP-2 Appendix A: Habitat Systems?

A: Unlike the original NextSTEP BAA Habitat thrust which allowed for subsystems, this solicitation is focused on complete habitat systems. Please refer to Appendix A Section 2.1 which states: “NASA is seeking proposals to provide complete deep space long duration architecture designs (including standards, common interfaces, and testing approach) and the development of full size, ground prototype units no later than 2018.”

Q42: Are Interface/Standard Working Groups for common interfaces and standards planned for environmental control functions (e.g. Air Revitalization, Water Processing, Waste Management) or logistics (e.g. common sparing approaches) and to be planned and included in SOW as separate tasks? In other words, how many standards working groups should be planned for, what expertise is required and should be included in the response?

A: Appendix A Section 4.2.1.2 Deliverables, requires SOW tasks for participation in government-led standards and common interface working group. The structure of the group has not yet been established, however as noted in Section 4.1.1.5 of Appendix A, proposals shall include what interface standards need to be identified for Phase 3. The common interface working group will be structured based on the sets of standards proposed by the participants of the working group.

Q43: Are there details on the release schedule and scope of additional appendices?

A: No. Interested parties are encouraged to monitor FedBizOpps.gov for opportunities through this BAA as well as other agency opportunities. It is standard practice for NASA to post a synopsis of upcoming solicitations a minimum of 15 days prior to posting the solicitation.

Q44: What will NASA do with the modules delivered to a center after it is done testing?

A: NASA does not intend to take ownership of the hardware but is only taking limited possession for test and demonstration purposes. Modules shipped to a NASA center will be returned to the contractor after the Government activities are done.

Q45: Page 10 of Appendix A states that CLIN's may be negotiated and activated based on programmatic priorities and funding availability. It also implies these CLINs may be activated at different dates during the contract. What is NASA awarding? I am assuming they are awarding contracts that include a list of work packages and even if the packages are spread out in time, NASA plans to use that to help define billing amounts.

A: NASA plans to negotiate and award selected CLINs for the base period and the option. Contracts will be incrementally funded and not all CLINs may be funded at the start of the contract, depending on available government resources. If/when the government decides to fund a CLIN, an ATP will be issued and the contractor may begin executing that CLIN. This would also apply to CLINs in the option. For example if an activity selected for execution starts in the base period (e.g., call it CLIN 1A), and proceeds to completion in the option (e.g. call it CLIN 1B), when the Government elects to proceed with the option it could activate CLIN 1B (contingent upon availability of funding and successful achievement of all CLIN 1A milestones). Once ATP is issued for a CLIN, NASA is committed to funding the completion of that CLIN, based on successfully achieving the milestones associated with it.

Q46: Can you describe more how the "on-ramp" aspect of this BAA works? Do you intend to facilitate matching system-level proposals with existing whole-habitat projects?

A: There is no actual on-ramp provision in Appendix A. However, there are currently four contractors under previous award for Phase 1 conducting concepts of operations and architecture studies for deep space habitat systems. Those contractors will be submitting proposals for Phase 2 as required in their Phase 1 contracts, refining architectures and developing ground prototype habitat systems. The contractors currently under contract also are free to team with other eligible entities for their Phase 2 activities. Additionally, NASA would like to provide an opportunity for other contractors that did not participate in Phase 1 studies to propose their innovative approaches that will both satisfy NASA's initial NextSTEP Phase 1 objectives and the objectives contained in Appendix A. NASA is seeking proposals to provide complete deep space long duration architecture designs (including standards, common interfaces, and testing approach) and the development of full size, ground prototype units no later than 2018. Any teaming arrangements are the responsibility

of the proposers. NASA expects all proposals to be for the full set of objectives as defined in the BAA and Appendix.

Q47: On page 12 of the BAA NNHZCQ001-K states: “(approximately ATP + 18 months)” What does ATP mean?

A: ATP stands for “Authority To Proceed”. It is the point in time at which the Government contracting officer authorizes the contractor to begin work. This usually means that a fully executed contract with finalized terms and conditions has been agreed to and signed by both the Government and the contractor. Note, there may be separate ATP’s issued within a single contract for Contract Line Item Numbers (CLINs) as programmatic priorities allow or funding becomes available.

Q48: I have a question about the cost-sharing requirement on the NextSTEP-2 BAA. We are considering a proposal where a commercial company might be subcontracted by our university to do a portion of the work. The commercial company would gain IP in the project – they are not merely doing a piece of work like a machine shop, for example. Does such a commercial entity as subcontractor need to provide cost-sharing, and would it need to be in the ballpark of 50% value?

A: Please refer to Section 3.2 of the Omnibus BAA and Section 3.2 of Appendix A that define the Corporate Resource (CR) requirements. The CR requirement for this Appendix is 30% of the overall effort with at least half contributed during the period of performance and the remainder may be prior contributions made within the last year. The CR requirement applies to the team, there is no requirement for how the CR is allocated among the team members.

Q49: After reading the BAA Appendix 1, we were wondering, when it says “feasible modular elements,” is this a call for complete modules as in the sense of an ISS module (such as the recently deployed BEAM), or do you envision supporting work on finer grain systems?

A: Unlike the original NextSTEP BAA released in 2014 which allowed proposals for subsystems, the NextSTEP-2 BAA, Appendix A is focused on complete architecture concepts and full size ground prototype habitats. Please refer to Appendix A, Section 2.1: “Therefore, NASA is seeking proposals to provide complete deep space long duration architecture designs (including standards, common interfaces, and testing approach) and the development of full size, ground prototype units no later than 2018.”

Q50: Will slides be available? Will there be a recording of the presentation?

A: Yes, slides will be made available at the NextSTEP website: www.nasa.gov/nextstep . There is no plan to release a recorded briefing.

Q51: Can a contractor currently on contract for Phase 1 submit a proposal for Appendix A, Habitat Systems?

A: Yes. However, the contractors currently under award for Phase 1 already have an obligation to produce a Phase 2 proposal as part of their Phase 1 effort. Any activities from

their proposal selected for Phase 2 will not result in new contracts but will be modifications to their existing contract.

Q52: Can a proposer submit a proposal with one of the four currently awarded contractors as a team member?

A: Yes. The contractors currently on contract for Phase 1 may also team with other companies for Phase 2.

Q53: Does this NextSTEP-2 BAA Appendix A include proposals for ECLSS systems or other subsystems supporting long term, deep space habitat systems?

A: No. Appendix A is focused on developing complete habitation systems.

Q54: Are not for profit entities (such as universities) allowed to submit a proposal?

A: Any U.S. private-sector entity meeting the eligibility criteria may submit a proposal. The proposals will be evaluated as described in the announcement.

Q55: Can industry members team together for a partnership?

A: Any company or team of companies meeting the eligibility criteria may submit a proposal. The proposals will be evaluated as described in the announcement.

Q56: What is the anticipated funding level for each awarded contract?

A: The funding level across the total effort for combined contracts for Habitat Systems is specified in Appendix A. Individual award amounts will be dependent upon specific proposals and final negotiated terms and conditions.

Q57: How will we know if due diligence is being performed during the evaluation? Or if we are selected for due diligence?

A: You will be notified if NASA requires any clarifications or further discussions.

Q58: How long will we have to submit a revised proposal if given that opportunity?

A: You will be informed of your response timelines at the time of any requests for additional information.

Q59: Who will own the IP rights for these developments worked with NASA?

A: IP ownership is determined by the nature of the entity doing the work (large business, small business, nonprofit organization, or educational institution). Please see the omnibus and Appendix A for details on data and patent rights ownership.

Q60: Will NASA allow other types of partnership relationships, such as grants, CRADA's, or Space Act Agreements?

A: The type of acquisition instrument will be defined in the Appendix describing each solicitation. The NextSTEP-2 omnibus BAA will not result in CRADA's and Space Act Agreement but has provisions for the possibility of contracts, grants, and cooperative agreements. Appendix A awards will be contracts.

Q61: How many contracts do you anticipate awarding?

A: The number of awards has not been anticipated but will be determined based on the number of qualified proposals of merit meeting requirements and the funding available. The funding available for this activity is defined in Appendix A, Section 6.3

Q62: How long will these partnerships last (is there an end date?)

A: Each solicitation will describe expected or potential partnership durations in the relevant Appendix. Efforts for various grants, cooperative agreements and contracts may vary from a few months to multiple years and may consist of initial studies with follow-on options for further development. The contracts anticipated for awards for Appendix A are described in Section 6.1 and may vary from 12 to 24 months depending on phases awarded, with potential follow-on phases.

TECHNICAL: OBJECTIVES/REQUIREMENTS

Q63: The BAA states NASA’s architecture for Phase 1 in the Proving Grounds envisions an evolvable and interoperable modularity approach that provides additional flexibility for launch options, whether it be leveraging the co-manifest capability on SLS or other alternative capabilities. Proving ground missions may warrant the study of habitats greater than 4-6 metric tons. Can we consider options that take advantage of incremental SLS upgrades that will increase co-manifested performance during the Phase 1 proving grounds?

A: Yes. Refer to the objectives in Appendix A Section 2.1. Also, as instructed in Section 4.2.1.5, proposals shall contain the details of all launch vehicle assumptions whether SLS or alternatives.

Q64: The BAA states that deep space habitation capabilities can be flown as co-manifested payloads on SLS Block 1B with an initial SLS co-manifesting capability of 4 – 6 metric tons starting in early-to-mid 2020s, or later in the 2020s on a cargo-only version of SLS, or on alternative launch vehicles.

(1) For alternate launch vehicle capabilities, what vehicles and launch mass capabilities should be assumed?

A: The offeror shall propose the launch vehicle concepts and associated assumptions to support their habitat concept of operations and architecture.

(2) For alternate launch vehicles that have not flown and assumed to be in some stage of design should we assume a decrement to published launch mass performance? If so, what capabilities should be assumed?

A: The offeror shall propose the launch vehicle concepts and associated assumptions to support their habitat concept of operations and architecture. This would include any assumptions on launch vehicle mass performance.

Q65: Documentation and Standards. When are these standards to be decided upon? And what is the time frame to comply? Are these standards specific to the designed systems or subsystems or are they intended to form a whole body of standards or framework to be used throughout the remaining phases of the NextSTEP program.

A: The awarded contractors are expected to refine their complete deep space habitat architecture concept, and develop the selected module(s) and selected associated subsystems that are consistent with their architecture. The contracted activity would include integration and test of the module (captured as severable CLINs and milestones). It is recognized that the prototype being developed may not be consistent with the standards and common interfaces developed by the NASA-led working group during the first 12 months. The plan for the working group is to also recommend options for which subsystems could be provided as common Government Furnished Equipment (GFE). During the last 6 months of the development, the contractor may be able to make limited adjustments to the prototype consistent with the common interfaces and standards. Moreover, the last 6 months will allow the contractor to revise their architecture and prepare proposals for the next Phase that will develop flight prototypes incorporating the standards and common interfaces.

Q66: Business plan and Commercialization of space in LEO (Low Earth Orbit): Are these studies purely conceptual? What level of prototyping be required for such concepts if any?

A: The Business Addendum should not be based on purely conceptual studies. Section 2.1 in Appendix A provides: “NASA is seeking proposals to provide complete deep space long duration architecture designs (including standards, common interfaces, and testing approach) and the development of full size, ground prototype units no later than 2018.” Also please refer to responses in other questions in this Q&A Log for the level of prototype being solicited.

Q67: Scope of the prototype. Can the scope of prototyping required be reduced to be limited to a proof of concept for the designed systems proposed?

A: Refer to NASA Procedural Requirements (NPR) NPR 7120.8 and Appendix A, Section 2.1 for the definition of “prototype”. Also refer to the specific objectives of the Appendix in Section 2.1.

Q68: How much emphasis is placed on new development versus leveraging existing capability to accomplish the objectives?

A: Refer to the Strategic Principles listed on chart 10 of the Industry Forum briefing posted at www.nasa.gov/nextstep. NASA does not have a specific emphasis on new development versus leveraging existing capacity. However, we do have an emphasis on evolvable architecture concepts.

Q69: Will the “potential GFE” ECLSS items be a subject of a further Appendix, or how will NASA develop those systems for insertion into the NextSTEP BAA Phase 2?

A: The plan for the standards and common interface working group is to also recommend options for which subsystems could be provided as Government Furnished Equipment (GFE). The method for developing those systems will depend upon many factors which have not been determined at this time.

Q70: Does NASA intend to execute on the development of your “Government Reference Architecture” at MSFC, JSC, or both centers?

A: Development of the government reference architecture will be an Agency level activity with participation by appropriate entities from both commercial industry and across NASA organizations.

Q71: Are subsystem providers (as opposed to full-up system/vehicle integrators) expected to provide hardware and subsystem solutions to the system integrators and/or NASA via a yet to be released Appendix?

A: Both the existing awarded habitat contractors and interested offerors for Appendix A are free to team with eligible partners.

Q72: The schedule of the potential GFE supplied subsystems and hardware is not illustrated in the Enclosure 1 schedule. When will GFE be provided, and will it need to be integrated prior to delivery in Phase 2c, or is it assumed integrated after delivery and the interfaces are what is confirmed prior to the module shipment?

A: The government-led standards and common interface working group conducted during the first 12 months of the activity will develop recommendations for potential options for the GFE. The intent is that these options may be pursued and exercised for Phase 3.

Q73: Is the scope of the BAA specifically targeted toward the overall design of habitats or will new capabilities that improve operations and reduce habitat mass be considered for award?

A: Please refer to Appendix A Section 2.1 which states: "NASA is seeking proposals to provide complete deep space long duration architecture designs (including standards, common interfaces, and testing approach) and the development of full size, ground prototype units no later than 2018." We are open to any proposals that improve the overall feasibility, evolvability and sustainability for habitation.

Q74: Describe the level of fidelity of the form, fit, function requirement of the spacecraft mockup.

A: There is a formal definition of "prototype" included in Appendix A. It does not need to be to the level of a flight-like EDU but the definition is broad enough to include that higher level of fidelity. Depending upon the specific system/unit being tested, there may be different emphasis on form vs fit, vs function testing to validate the concept of that system/unit.

Q75: Does the outer hull have to completely surround the mockup?

A: The degree of hull should be chosen by the offeror, keeping in mind that tests will be focusing on form, fit, function, and interaction of the article with other aspects of the system. Virtual reality may be allowable as one of the ways to convey design as well as to perform testing. Human factors and human interaction with the prototype will be tested.

Q76: The Appendix A mentions there is a SLS flight every year. Does this mean there would be a production run of habitat modules?

A: The yearly co-manifest SLS launches may be used as an opportunity by the offeror to build up/deploy their proposed habitat system concept and associated logistics to meet full

deep space capability. As specified in the BAA Appendix A section 4.2.1.5, the concepts must include other launch vehicle assumptions if proposing not to use SLS exclusively.

Q77: Would NASA be open to witnessing, participating in, or conducting testing at the contractor's facilities as opposed to shipping a system to a center?

A: As the BAA notes, we expect the contractor to test at their facilities before integrated testing at a NASA site. NASA does not require access to witness contractor tests first hand but resulting testing data is required. Also note the proposal requires a CLIN for developing a shipping concept, preparing, and packaging module(s) for shipping to a NASA Center.

Q78: It is unclear who will be doing the integration of the complete habitat system and there is reference to GFE. Can you clarify whether NASA will be doing the overall system integration, or will the contractors be required to do that?

A: The awarded contractors are expected to refine their complete deep space habitat architecture concept, and develop the selected module(s) and selected associated subsystems that are consistent with the architecture. The contracted activity would include integration and test of the module (captured as severable CLINs and milestones). It is recognized that the prototype being developed may not be consistent with the modular, evolvable architecture standards and interfaces developed by the NASA-led working group during the first 12 months. The plan for the working group is to also recommend options for which subsystems could be provided as Government Furnished Equipment (GFE). During the last 6 months of the development, the contractor may be able to make limited adjustments to the prototype consistent with the common interfaces and standards. Moreover, the last 6 months will allow the contractor to revise their architecture and prepare proposals for the next Phase that will develop flight prototypes incorporating the common standards and interfaces.

Q79: What is the expected fidelity of the prototype modules developed?

A: We expect full size form and fit and some level of functionality.

Q80: How will AES developed technologies and concepts work into the NextSTEP habitat program?

A: The concept for integrating AES-developed technologies is depicted in the Virtual Industry Forum presentation posted to www.nasa.gov/nextstep

Q81: What hardware will be needed to support the testing of the ground prototypes? When will this hardware be specified?

A: The proposers are to specify the testing and associated hardware and facilities for their proposed concepts. There will also be standards and common interfaces defined in the standards working group.

Q82: When you start getting hardware, how are you going to contractually manage delivery of hardware to centers?

A: Appendix A Section 4.2.1.4 contains instructions for proposers for shipping arrangements.

Q83: How will the interface standards working group operate? What are the expected products and goals of the working group and who will be the members?

A: NASA will work with working group members to determine a charter and terms of reference for operating the organization.

Q84: Why is NASA potentially funding multiple modules from different contractors?

A: Various approaches have different advantages and employ different innovative concepts and functional allocations. We wish to allow concepts showing potential to continue their development so we may test them and obtain lessons learned.

Q85: Are multiple proposals allowed?

A: Yes, however we encourage offerors to consolidate their best concepts into a single proposal.

Q86: What testing will be conducted on the modules?

A: The types of testing envisioned for the modules is described in the Virtual Industry Forum presentation.

Q87: What are the shipping requirements or constraints on the modules?

A: Appendix A of the proposal instructs offerors to define the shipping concept.

Q88: How precise does cost need to be?

A: The prices for the need to be as precise as possible since these costs will become the fixed price of any resultant contract awarded. The proposal may contain estimates of lower fidelity for follow-on phases, but NASA expects these estimates would become more precise particularly if the follow-on efforts were also awarded on a fixed priced basis.

Q89: How many resumes are required?

A: The number of resumes is a business decision for the proposer.

Q90: What does 30% minimum corporate resources (CR) mean?

A: Corporate contributions are measured in relation to the entire effort, which is the combination of corporate resources and government resources if any are proposed. Therefore, when a minimum of 30% CR is required, the corporate contribution must be greater or equal to 30% of the sum of the total government costs (price plus GFE/GFP) and corporate resources. See Section 3.3 of the omnibus BAA and Section 3.2, Appendix A: Habitat Systems for more specifics on corporate contributions.

Q91: Do state and local funds count?

A: Please refer to the amended Section 3.3, Corporate Resources, of the Omnibus BAA.

Q92: What about corporate sponsorship passed through from the Government?

A: No, these would not count towards corporate resources.

Q93: If they have partners (non-government), will their contributions count?

A: Yes. Non-government co-proposers contributions count as corporate contributions.

Q94: Please clarify use of specialized government facilities.

A: Use and cost need to be included in the proposal. Any proposed use of a Government facility will be treated as Government resources and will need to be offset in the corporate resources area. Refer to Section 3.3, Corporate Resources of the omnibus BAA and Section 3.2 of the Appendix A.

Q95: Is there a statute of limitations on how long the investment in facilities counts?

A: Please refer to the Corporate Resources section of Appendix A.

Q96: Are universities eligible to fill the role of the private partner?

A: Yes, refer to the Eligibility Information in the omnibus BAA and Appendix A.

Q97: Is the prior investment rule for the entire proposal, or, will each organization participating in a proposal need to claim some sort of cost or in kind contribution or investment?

A: Please refer to the Section 3.3, Corporate Resources and Section 3.2 of Appendix A. The corporate resources is based on the entire proposed effort.

Q98: Can prior government investment be counted toward the 30% rule?

A: No. Please refer to the amended Section 3.3, Corporate Resources.

Q99: The eligibility clause states prior IRAD funds are deemed acceptable for this effort. Is there a time window allowing credit of prior IRAD spending? Or can the credit be applied to all prior relevant IRAD projects that contribute to this proposal?

A: The requirements for Corporate Resources will be specified in each Appendix. For Appendix A, please refer to Section 3.2 of the Appendix.

Q100: Are SBIR funds also applicable towards the corporate contribution requirement, and if so, is there a time limit on those?

A: SBIR funds originating from previous federally funded efforts are not applicable toward private corporate contributions. Any corporate resources devoted to those previous effort would count toward the percentage of CR requirement if those resources were provided within the statute of limitations. See Section 3.3 Corporate Resources of the omnibus BAA.

Q101: I understand that NASA centers are not allowed to lead proposals, but I was unable to determine from the announcement if they are allowed to be partners, and if so, are they allowed to provide cost-sharing?

A: Please refer to the, eligibility sections of the omnibus BAA and each individual Appendix.

Q102: I am curious if funds from other government agencies (such as DoD SBIR funds) can be included in the cost match?

A: No, funds from other FEDERAL government agencies cannot be included as corporate contributions.

Q103: For a foreign participant in a US led proposal, can the “funding/sponsoring institution” be the foreign company itself? That is, can a foreign company

participate with a US led team by contributing (self-funding) work in coordination with the US led team?

A: Yes, foreign participants are eligible to respond to the BAA, but must comply with the Guidelines for Foreign Participation which require there be no-exchange-of-funds. See section 3 of the amended BAA for more specifics on eligibility information and guidelines for foreign participation.