

BAA 04-23

Questions and Answers

August 4, 2004

1. Q. Section 1.2 of the PIP says that government laboratories are encouraged to propose, but Section 3.1 says that participation is limited to US firms and universities (neglecting to mention government labs). Can a government lab propose as a prime contractor?
 - A. **Government entities that are not a Federally Funded Research Lab (FFRL), are not permitted to be a prime on a contract or to receive funding through a prime. They may, however, be on a team as long as their funding is separate.**

2. Q. Section 4.1.2 of the PIP specifies that the electronic submission be in Word 2002 format. Can I submit a PDF file instead?
 - A. No. The government requires that the submitted documents be in Word format to facilitate the source selection process.

3. Q. In the table on page 7 of the PIP, under Pulsar Cataloguing, the required position accuracy is listed as 0.0001 arcsec. Should this be radians or degrees and not arcsec?
 - A. We do in fact want to be able to track sources to 0.001 to 0.0001 arcsec (1 arcsec = 4.96 microradians). Optical stars have been tracked on the ground to these accuracies in right ascension and declination as have many pulsars.

4. Q. Section 1.3 states that the program funding for Phase I is \$6 million. Is this intended to cover all potential Phase I awards?
 - A. Yes. The total combined funding for all awards made in Phase I is approximately \$6 million.

5. Q. Is there an intended monetary breakdown between the 4 task areas in Phase I?
 - A. No. There is no predefined breakdown of the Phase I funding between the task areas.

6. Q. If a team is proposing for all four task areas, should this be done as a single proposal or as two proposals, one for areas 1-3 and one for area 4?
 - A. A team should submit **one proposal** if proposing for all four task areas to facilitate the source selection process.

August 5, 2004

1. Q. What are the objectives of Phases I, II, and III?

- A. The objective of Phase I is to develop the technology to enable the design and integration of a position, attitude, and time determination system. The objectives of Phases II and III are to develop an integrated payload that will form the basis of a space flight experiment.
2. Q. In section 2.1, technical area 4, a field of view of 60 arcmin x 60 arcmin is specified. Is this field of view intended as a minimum, a maximum, or an exact dimensions?
- A. The 60 arcmin x 60 arcmin field of view is an approximation. The field of view should be large enough to ensure that the sensor can obtain a pointing estimate of the required accuracy in a reasonable time from startup or a reset.
3. Q. In Section 2.1, Technical Area 4, what is the distinction between field-of-view and field-of-regard?
- A. The field-of-view refers to the instantaneous area of the sky visible to the sensor; whereas, the field-of-regard refers to the range through which the sensor shall be able to be directed with respect to the system.
4. Q. Please explain the meaning of the following sentence in Section 2.1, Technical Area 4: "System may be able to achieve point control accuracy of 1 arcmin with pointing knowledge of 1 arcsec." Specifically, are these instrument pointing accuracies intended to be met by a control system not using the X-ray data or by using the X-rays as measurements?
- A. The system shall be able to achieve these accuracies without using any additional sources of pointing information such as visible star cameras, Earth horizon sensors, sun sensors, etc.

August 9, 2004

1. Q. Will government/industry one-on-one meetings be held as part of the Industry Day?
- A. Yes, there will be time in the afternoon for one-on-one meetings with Dr. Pines, the XNAV Program Manager. There will be a sign-up sheet available at the Industry Day registration table.
2. Q. Is it the government's desire to have one team doing all four tech areas or to have different teams on technical areas 1-3 and area 4 per the BAA structure?
- A. While there are advantages in dealing with one vs. two teams, the government's desire is to have the best teams possible for technical areas 1-3 and area 4. A single team will be selected for all four technical areas only if its proposed solution is superior for all four areas.
3. Q. Will the government reserve the right to accept all or part of a proposal for award resulting in, say, technical area 2 picked out of a complete proposal?
- A. The government does reserve the right to award parts of submitted proposals. There is a modest probability that a proposal submitted for all four technical areas will be selected

for just areas 1-3 or area 4. There is a lesser, though real, probability that a proposal submitted that includes areas 1-3 will be further subdivided.

4. Q. If technical areas 1-3 and technical area 4 are different contractors at the conclusion of Phase I, will the technical area 1-3 contractor be a subcontract to the technical area 4 contractor or their output GFE'd to the technical area 4 contractor?
 - A. No, there will be separate contracts awarded to each team that is selected to perform any of the technical areas.

5. Q. Is it the government's intention to downselect from the possible four awards at the conclusion of Phase I?
 - A. The government reserves the right to downselect or recompetee for Phase II and Phase III awards or to choose to not proceed.

6. Q. Section 4.1.4, top of page 13 says "technologies developed in this program will be evaluated and tested in the Government's facilities." Does this apply to the integrated instrument design of technical area 4 and if so, does this imply that system functional/environmental testing should be planned at the Government facility?
 - A. The proposer should validate the operation of their payload system at their own facilities first. Thus, system functional testing should be done at the performer's site. The government may additionally test the system in its own facilities at no cost to the performer.

September 9, 2004

1. Q. Is participation in the XNAV program limited to US firms only or can there be some non-US participation?
 - A. See PIP Sect. 3.1, for eligibility criteria. In summary, US firms and universities are eligible but may include foreign personnel as part of their resources. We will stay with what is stated in the PIP and ensure that ITAR laws are maintained.

2. Q. Will the Govt. require star trackers, sun sensors, and GPS or will numeric requirements be specified leaving the solution to performers?
 - A. The exact configuration will be left up to the performers. The primary purpose of attitude determination sensors is for validation of the XNAV sensor performance and possible protection from solar radiation.

3. Q. Does the Govt. mean "time of arrival of photons", or time resolution of the repeating pulsar X-ray waveform?
 - A. The time of arrival of the X-ray photons must be accurately tagged in addition to good knowledge of the features of the waveform in order to complete the navigation solution.

4. Q. Do any of the 10 pulsars referenced lie out of the galactic plane or in other galaxies?
A. Most lie within in the galactic plane of the Milky Way galaxy.
5. Q. Can a subcontractor participate on different teams under different areas?
A. Yes.
6. Q. Will organizations/teams be able to have a face to face meeting after the Industry Day?
A. Yes, as schedules allow. Teams may contact Dr. Pines or Mr. Michaux to schedule a meeting.
7. Q. Why does the Govt. require 150 eV energy resolution?
A. This was a goal that was generally applicable in the 1 to 2kev range. Below that it is not applicable.
8. Q. Can a contractor participate both as a prime and a sub in submitting a proposal?
A. No.
9. Q. What exactly does the 1 nanosec timing goal mean?
A. The 1 nanosec goal is the 3-sigma uncertainty.
10. Q. Are the proposers expected to address the issue of jitter from the ISS?
A. The proposers are not expected to address jitter issues in detail for the Phase I proposal. There will eventually need to have an error budget for the expected jitter but this will have to be worked out with NASA/Johnson Space Center (JSC).
11. Q. When does the launch of the final experimental sensor occur in relation to the program phases?
A. The launch will occur near the end of Phase III. Though the best case scenario would put that around Jan. 2007, the actual date will depend on program progress and the Shuttle return to flight schedule.
12. Q. Must the proposers discuss operation of the sensor on ISS?
A. The DoD is negotiating with NASA HQ regarding ongoing operation of the sensor. Since the operation of the sensor begins near the end of Phase III, it is not required to be discussed in detail for the Phase I proposal.
13. Q. Has the Govt. looked at the integration times possible on the ISS?

- A. Yes. Preliminary simulations indicated that viewing times on the order of $10^4 - 10^5$ sec are possible with the average just below 10^4 .
14. Q. Is the arcsec attitude requirement based on the X-ray solution only.
- A. Yes. The other attitude sensors are required for validation of the X-ray solution.
16. Q. Can an organization bid on just one task area between tasks 1-3?
- A. No. Organizations or teams must bid either on tasks 1-3, task 4, or all tasks.
17. Q. How many contracts are to be awarded?
- A. The Govt. would like to award up to four contracts for this BAA. That could be comprised of two contracts for tasks 1-3 and two contracts for task 4. If there are two viable proposals for all task areas there could be as little as two contracts awarded. If there are more than two viable proposals for all task areas, three contracts may be awarded if additional funding is approved.
18. Q. Will any hardware such as star cameras be government supplied?
- A. No. All hardware required for the solution must be included in proposal.
19. Q. Should the Phase I proposal address what the team will do in Phases II and III?
- A. Yes, as it applies to the proposed solution. Great detail is not required but some mention of the transition should be included.
20. Q. Will Phases II and III be open for proposals by groups not involved in Phase I?
- A. The current plan is to downselect from the teams selected for Phase I. The ultimate determination will be made by the DARPA Director, Dr. Tony Tether.
21. Q. Are proposers expected to address risk in their proposals?
- A. Yes. Part of the evaluation criteria will look at what the risks of the proposed solution are and the planned risk mitigation plan for those risks.
22. Q. Does the government mean to say SEP (Spherical Error Probable) rather than CEP (Circular Error Probable) in its goals?
- A. Yes. SEP is appropriate for inertial navigation. Disregard any occurrence of CEP as a typo.

23. Q. Does the Govt. intend to award CPFF contract for Phase I as stated in briefing charts?

A. No. Disregard any reference to CPFF contract award for Phase I as a typo. Phase II is likely to be a CPFF contract award.

25. Q. We are interested in being a prime/sub on a team. Can you help us locate potential team members?

A. Follow the tab on the Industry Day home page or [click here](#) to access our teaming database.

27. Q. Where can we learn more about teaming agreements?

A. Review the DARPA other transactions page: http://www.darpa.mil/CMO/other_trans.html