

Pluto-Kuiper Belt (PKB) Mission
Phase A Concept Study Kick-off Meeting
June 18, 2001
NASA Headquarters

Colleen Hartman opened the meeting by congratulating the teams and indicating that this is a very exciting time. She then presented some general information concerning the concept studies. Each team will receive \$450K in real year dollars. The reports that result from the concept studies (CS's) will be reviewed and one group may be selected to proceed. Hartman reminded the teams that there is currently no money in the budget for the PKB mission, so there will only be a selection if funding turns up (and assuming that at least one of the studies is evaluated favorably). She then stated that this meeting is to provide the teams with final instructions for conducting their CS's.

Hartman then discussed some details of the upcoming work. The deliverables for this next step include a final report and a priced proposal. The reason for this latter item is so that, if a selection is made, the next step in the contract can be initiated as quickly as possible. She reminded the teams that their proposed mission should include Phases A through E. Additionally, the proposed cost must not exceed the cost cap of \$500 million and costs should not have grown by more than 20% over the initial proposal. This entire process is a 1 step procurement, but the process involved is 2-steps. The first step has been completed and Step 2 involves the CS.

Details of the CS were also provided by Hartman. It should provide a detailed examination of the implementation of the mission. Plans for Education and Public Outreach (E/PO), Small Disadvantaged Business (SDB) involvement, and new technology transfer and infusion will also be evaluated. Assuming that there is funding, the evaluation of these CS's may lead to the selection of one team to proceed with mission development. The AO is still valid and the total mission is cost capped, as mentioned above. Costs of the Data Analysis Program (DAP) and Participating Scientist Program (PSP) do count against the cap, but any proposed Phase F is not included. Hartman indicated that new stringent rules involving foreign participation will be outlined later in the meeting. She further reminded teams that after downselection there can be no cost growth, or the mission would be subject to cancellation. However, Hartman pointed out that NASA Integrated Action Team (NIAT) costs (up to \$6 million additional dollars) are not included within the cost cap.

In terms of scheduling, Hartman indicated that there would be a confirmation review at the end of Phase B. If all is well, the mission will be allowed to continue with development in Phase C/D. Hartman reminded the teams again that, even if funding becomes available, NASA will not make a selection if there is not a viable mission presented.

Hartman then briefly reviewed the upcoming reorganization of Code S at NASA Headquarters. Code S will be broken into three divisions; the Solar System Exploration Division will manage the PKB mission. Carl Pilcher will be the Division Director and

Colleen Hartman will be the Deputy Division Director. Kurt Lindstrom will be the PKB Program Executive (PE).

At this point Hartman thanked the teams and congratulated them, and then turned the meeting over to Denis Bogan.

Bogan also congratulated the teams and informed them that a recent amendment to the AO increased the time allowed for the CS from 2 months to 3. He indicated that each team would receive \$450K for their CS and informed the teams that, "the money is there now". During the CS's, the teams will produce a report which will be evaluated by NASA. It is hoped that there will be no change in the science as a result of these studies. If it is necessary to make a change, these changes will be evaluated by a reconvened science panel. The bulk of the report will be evaluated by a Technical, Management, Cost, and Other Factors (TMCO) team, which will focus on implementation issues such as cost, feasibility, management, etc. Bogan then showed the URL for the PKB Mission Library, and informed the teams that they would find (to be posted ASAP) the criteria and guidelines for the CS there, as well as examples.

Bogan briefly reviewed some of the administrative aspects of submitting the CS reports. The reports are due to NPRS no later than 4:30 PM on 9/18. In addition to the signed original, 60 copies must be submitted. No late reports or errata will be accepted for any reason. Bogan will be the overall evaluation Chair, with Brad Perry serving as TMCO Co-Chair.

The content of the reports was then reviewed by Bogan. The first section is the science. Since the Step 1 proposals were selected primarily based on science, there should be no changes or only minimal changes to science in the CS report. Any and all changes must be highlighted in the CS report. A question had been asked if a change in the science team needed to be re-evaluated. Bogan indicated that as long as the science objectives and goals remained unchanged and the content of the science section was unchanged, a change in personnel was acceptable (but should, nonetheless, be documented). Bogan indicated that the major emphasis of the evaluation would be on the Implementation section of the CS report. Details of the section requirements for the CS report are included in the documents that can be found at the PKB Mission Library. Bogan reminded the teams that the evaluation criteria for the CS reports are the same as for the AO (sections 6.3.3 and 6.2.1). He reminded teams of the restrictions on maximum cost and cost growth.

Bogan then reviewed the evaluation schedule, highlighting the fast pace. Finally, he reminded the teams that this is still a competition and thus communication after this meeting would be strictly controlled. A list of Points of Contact (POC's) who the teams can contact with specific questions will be provided. Programmatic questions should be addressed to Denis Bogan and answers to these questions will be posted on the homepage. Bogan then turned to meeting over to Brad Perry.

Perry began by distributing copies of the guidelines to the Principal Investigators (PI's). He indicated that these guidelines had undergone several revisions in the past week and that it was possible there might yet be changes. He encouraged the teams to check the web site for updates. Although not yet posted, he stated that the guidelines would be posted as soon as possible.

QUESTION: Will the same system be used for announcements and updates as was used for the Step 1 Selection Process?

ANSWER: Yes. For example, a modification to the AO has been posted extending the CS from 2 months to 3.

QUESTION: Could the PI's be notified when changes are made?

ANSWER: Yes, we can do that now that there are only two teams involved. However, teams should still check the web site regularly.

Perry then continued with a review of the guidelines. The AO is still the governing document with the exception that Appendix F is no longer valid. The teams here were selected primarily on science, and for this evaluation implementation will be emphasized. The eight areas to include in the report were briefly shown (science, technical approach, management, plans for outreach, Phase B plan, cost plan (Phases A-E), cost plans for any Phase F, PSP, or DAP, appendices). Science should not change, but if it does then the changes must be highlighted. The CS report should be a stand-alone document; references to the original proposal should not be made. General format of the CS report is included in the guidelines. One of the required appendices is a Mission Definition Requirements Agreement (MDRA), which must be signed by all proposal partners.

Perry then discussed requirements concerning the 2004 and 2006 launch windows. He indicated that costs for both the 2004 and 2006 options need to be included in the CS report. Additionally, teams must maintain compatibility with both launch vehicle (ELV) options in Phase A. The CS report should document all costs associated with maintaining this dual compatibility through at least mid-2002. In part, because of these requirements, the page count for the technical approach section has been increased to 118 pages. For costs associated with ELV's, RTG's, DSN, and other government-provided items, Perry encouraged the teams to use the latest costs available from the POC's. He indicated that he is still working out who some of these POC's will be. Additionally, teams must provide a letter of commitment from the POC's regarding commitment, services, and costs associated with these items. For international participation, the CS report should include at least draft agreement(s).

QUESTION: What exactly is a draft agreement (for international participation)?

ANSWER: This should be a semi-formal document, but it does not yet need to be signed. The next speaker will clarify this.

Additional requirements were then outlined by Perry. Full cost accounting must be used and substantial expenditures in Phase B of Phase C/D money for long lead procurements is not allowed. This is similar to Discovery, where only minimal long lead procurements are allowed in Phase B. All letters of endorsement are needed. The cost proposed in the CS report is final, unless NASA imposes changes. Plans for E/PO, SDB, and new technology must be completely described. Reports are due at NPRS by 4:30 PM on 9/18. The address for delivery is given in the AO. In addition to the signed original and 60 copies, a zip disk containing the report must also be included. No errata sheets will be accepted.

Perry then outlined some changes in the evaluation process. In Step 1, Technical, Management, and Cost (TMC) was evaluated with three risk ratings (high, medium, low). For the evaluation of the CS reports, 9 levels of risk will be considered. He reminded the teams that cost realism is an important part of the evaluation. Proposals near the cap or with poor reserves will be considered risky. Similarly, new technology increases risk unless it is at a technical readiness level of 8 or better, or have demonstrated back-up(s). Teams should not avoid new technology, but they need to demonstrate that they are aware of the risks and have taken steps to mitigate them. The cost evaluation pyramid was shown briefly to demonstrate to the teams the rigor to be included in the TMC evaluation. Perry underscored that the entire TMC team is involved in the evaluation of cost issues. Unlike Step 1, the cost assessment, which includes an analysis of the proposal and independent cost models and an identification of cost risks, will result in a separate Cost Risk grade on Form C.

Site visit requirements were then discussed by Perry. Each team will host a 1-day site visit, comprised of 8 hours of presentations/questions, a 1 hour tour, and 1 hour for lunch. The bulk of the time will be spent on oral briefings to an evaluation team of 15-20 people. No splinter sessions will be allowed. The entire TMCO team must be present for all presentations. This is an opportunity for the proposing teams to present clarifications of important details of their CS. These site visits are expected to occur in the October 4-9 timeframe. One team will be visited on October 4 or 5, the other on October 8 or 9. The goal is to start Phase B in early November, and this controls the timing of the site visits. Perry indicated that he is the POC for all site visit arrangements. He wants to have final arrangements for these visits in place by the end of August. The second half of the lunch hour during the visit should be an opportunity for the evaluation team to caucus in private. This will provide the team an opportunity to review what they have heard and to identify areas of additional clarification that are needed. Perry indicated that written questions would be faxed to the proposing teams by 8:30 AM Eastern time, 2 calendar days prior to the site visit. Both teams will have the same amount of time to prepare answers to these written questions. Oral questions will also be asked during the site visit.

QUESTION: Are those 2 days real days or work days (amount of advance notice for preparing responses to written questions prior to the site visit)?

ANSWER: Those are real days. We realize it may be awkward for the second set of visits, as this involves weekend work. We will look at the schedule to see if we can do anything about this. We want everything to be completely fair between both teams.

Perry then indicated that, in addition to the CS report, the site visit will be considered in the evaluation of the proposal. He then briefly outlined the various kinds of risk and identified the 'actionees' who must mitigate these risks. There is inherent risk to the mission (flying to Pluto is not easy). There is programmatic risk, which will be addressed by NASA and other government agencies (e.g. DOE regarding RTG use). Finally, implementation risk will be addressed by the proposers and also to be discussed with each team during their debriefing.

QUESTION: The chart shows that there is a low risk associated with delay of Phase B beyond November 1?

ANSWER: Yes, the risk is low because it is our goal to allow you to begin Phase B by then, and we will do everything possible to stick to a schedule that will allow this to happen.

Additionally, Perry indicated that NASA is strongly committed to mitigate schedule risk where possible. For example, NEPA/launch approval typically takes more than 4 years, which is unacceptable for this mission. NASA will do all in its power to expedite this process.

Perry closed by reviewing the evaluation flow chart. He highlighted the compliance check, which will be conducted shortly after proposals are received. Administrative and other compliance issues will be checked. A science panel will reconvene only if there are changes to the science. If the science panel does not meet, Form A will be taken forward from the Step 1 review. Form B will be reaccomplished, because there will be TMC inputs into this evaluation even if the science panel does not meet. Form C will contain the findings of the TMC review, and Form D will contain the "other factors" (E/PO, SDB, new technology) findings. The review schedule includes a plenary meeting at LaRC, site visits, and a final plenary at LaRC. The earliest possible date to brief the selection official is 10/17. The goal is to announce the Downselection results in late October.

Don Miller briefly reviewed the international participation requirements. Miller indicated that a letter of agreement is needed if there is foreign participation of any kind. The International Traffic In Arms Regulations (ITAR) is a big concern right now and thus, in some situations, a team may need an export license. (There was a brief pause while Perry, Miller, and others caucused in the hall.) Miller returned and advised the teams to work with the PKB PE about international issues. The PE in turn would work with the international relations folks at NASA. NASA will assist the teams in getting an agreement ready. It is critical that the foreign entity who is involved have authority to commit the foreign government to a binding agreement; if they are not, another entity will need to be involved. Miller indicated that once any agreement is in place, teams

should talk to the POC in Code ID (Export Control) to determine if a license is needed. John Hall is the POC, and his contact information was provided.

QUESTION: Is it correct that an 'interim agreement' covers the study phase?

ANSWER: Yes. This allows you to begin work before the final agreements are in place.

Darrell Foster then took the floor to discuss ELV requirements. He is the POC for this area, and he highlighted changes to ELV requirements from the pre-proposal conference. He pointed out that there are two paragraphs in the guidelines related to ELV's. The first is the requirement that proposers provide a rationale for their choice of ELV. The second is the requirement (mentioned previously) that proposers maintain dual compatibility with the Delta IV and the Atlas V. Both of these ELV's are new developments, and as such there is risk associated with the first flights. The PKB mission should thus keep its options open as long as possible regarding which ELV will be used. A new web site (<http://elvperf.ksc.nasa.gov>) has recently been made available to assist proposers in evaluating ELV performance. It is very informative, but if that doesn't help, proposers should contact Foster.

Foster then indicated that the cost figures are under review, but that he doesn't expect them to change. There are three categories of cost, each of which tries to capture a full cost "envelope". The teams were advised to cost ELV's as they did in the Step 1 proposal. Foster then indicated that his office still needed to talk with Code S regarding the allocation of funds for spacecraft advanced studies (such as loads analyses). The launch facility does not budget for the costs associated with these studies, which are likely to be needed in Phase B. Proposers were advised to identify any studies that are needed, so that costs could be budgeted. The office is still expecting first launches to occur in the first half of 2002.

QUESTION: What should we say in proposal about dual compatibility?

ANSWER: We need to understand the impacts if your team cannot maintain this compatibility through mid-2002. So please contact me directly if you have questions, email is best. We are working to get commitment letters ready for both of you.

QUESTION: Will you be sharing these conversations on the web site?

ANSWER: This is like Discovery, I (Darrell Foster) am your POC and, since you are selected already, not all answers will be posted. Those of a general nature will be, but for the most part our conversations will be private. Foster is not part of the evaluation.

At this point Perry clarified that Foster will provide ELV answers that NASA will stand behind. If the teams go outside of the POC channels (e.g., directly to the manufacturers for ELV information), NASA will not necessarily stand behind any answers/advice given through these channels. The letters of agreement will be signed by Foster, not the ELV industry provider.

QUESTION: Are cost and performance for any 3rd stage carried by the spacecraft?

ANSWER: Yes. Take the information provided for the 1st and 2nd stages and integrate the 3rd stage.

QUESTION: So the performance curves given in the AO for upperstages are for?

ANSWER: Are for reference only.

QUESTION: So we shouldn't use those curves? We should work with you?

ANSWER: Yes. We need to make sure that we all understand the performance.

At this point, Perry announced that the RTG speaker was unavailable and an emergency replacement was being sought. Mark Dahl will be the POC for RTG's, but he is out of the country this week. Bogan said that Dahl has a draft environmental impact study from Pluto Kuiper Express that should be largely applicable to PKB. Dahl feels this may save about 6 months.

After a 5-minute break the group reconvened. Perry reminded everyone that the presentations would be posted on the web as soon as possible after the meeting. He then pointed out that E/PO requirements for Step 1 had been streamlined, and that the requirements for Step 2 were more comprehensive. He then turned the meeting over to Rosalyn Pertzborn to discuss E/PO.

Pertzborn indicated that the E/PO group at NASA had worked recently to modify and simplify the process. She will be available to answer questions - both general (answers posted on the web) and specific. Pertzborn indicated that the primary goal of E/PO at NASA is to share the excitement of space exploration with the public and school children. She pointed out that Pluto is unique in its ability to interest people, and she encouraged proposers to take advantage of this. Additional goals are to enhance the quality of science and math teaching at school (particularly pre-college), and to improve the qualifications of the future work force. She encouraged proposers to read the E/PO Strategic Plan.

QUESTION: We all know Pluto is exciting. Do the people upstairs share this view?

ANSWER: Certainly Dr. Weiler is strongly committed to E/PO.

Pertzborn continued by describing the current status of E/PO activities. NASA is committed to making a major contribution to science, math, and technology understanding. There is a major national program underway; several recent reports, newsletters, and the recently-updated homepage all highlight this program. There has been a lot of progress recently. In the year 2000 there were over 1500 discrete events,

both in the US and in other countries. Greater than 200 partner institutions have been involved, including commercial organizations.

The content of the CS report was then reviewed. They are looking for a credible story about what the team is going to do (no rhetoric). A lot can be said in the four available pages if you are efficient, and the required letters of commitment can further provide examples of what the plan encompasses. Typically 1-2% of the budget should be devoted to E/PO and it will be important for the teams to think about how they will allocate this funding over the long lifetime of this mission. A well-developed, mature plan providing details of what will be done should be included. These plans will be evaluated by scientists and educators. Pertzborn then emphasized that the science team should be actively involved in the E/PO program. Key personnel should be identified in the proposal and E/PO should be included as part of the management plan. She indicated that it is important to coordinate with other E/PO programs and to have demonstrated partners who are likely to still be around when this mission would finally reach Pluto.

The general and specific evaluation criteria were then reviewed. These have not changed since the AO and Step 1. A very important criterion, which typically has not been well-addressed by proposers, includes the plans to evaluate the success of the E/PO activities. A budget of 10% of the E/PO budget for this activity is not unreasonable. Because of the large amount of funding available, it is expected that these E/PO plans will have both breadth and depth and a national program (versus state or regional) is preferred.

Pertzborn then reviewed some of the resources available to the teams. There is an updated web site (<http://spacescience.hq.nasa.gov/education>) that includes a set of FAQ's in the E/PO Explanatory Guide. Contact Pertzborn through Bogan or Perry if you have questions. She also encouraged teams to work with their local Broker/Facilitator (B/F) and/or the OSS Education Forum. Both of these groups are there to help, but not to write the proposal. New B/F's are currently being solicited, but results will not be final until after your CS report is due. Thus use the existing B/F's, and we'll make whatever changes are needed after those awards are made. Additionally, the appropriate Forum is housed at JPL, but all discussions are confidential, and so the non-JPL team should not be concerned about any conflicts.

Pertzborn concluded by saying that NASA and these resources now have a very good sense of what works and what doesn't work concerning E/PO. NASA is committed to E/PO, and the proposers should be too.

At this point, Perry indicated that they were unable to find an emergency replacement to discuss RTG's. He encouraged proposers to contact Mark Dahl as soon as he returns next week.

Bogan then indicated that he had received some written questions and would post answers to these on the web soon. He then opened the floor the questions.

QUESTION: What is the Mission Definition Requirements Agreement (MDRA)?

ANSWER: It is one of the required appendices.

QUESTION: Where can we find information about what it is?

ANSWER: There is an example of one on the web site. If that doesn't help, ask Brad Perry.

QUESTION: You said that all partners must sign the MDRA. What constitutes a "partner"? Every CoI institution?

ANSWER: We will need to clarify that. We will follow this up with more information on the web.

QUESTION: Do you need the information on NEPA/launch approval in the report? Should we be working this now?

ANSWER: Yes, talk with Mark Dahl as soon as you can and get started. He can help you with details. He is already working on the Environmental Impact Study (EIS) and workbooks.

QUESTION: Could you elaborate on the site visits? What is the format?

ANSWER: This will be a 1 day visit to the site of your choice. Coordinate the visit with Brad Perry. There are a few rules: 8 hours of presentations, no splinter groups, 1 hour tour, 1 hour for lunch and private evaluation team caucus. That caucus will help us ensure that we are getting the information we need from you. We want to look at the implementation, see the commitment, and have you answer our questions. In addition to the written questions you will receive ahead of time, we will have oral questions. But we will try not to let those questions derail your agenda. These site visits have been done before (Discovery, Explorer) at both your organizations. Someone there should be able to help you.

QUESTION: You had indicated that there would be 2 days to answer questions. Discovery had longer, which I assume is because we are on such a tight schedule. But do we really need to spend the weekend answering questions? This may be a problem.

ANSWER: Yes, I can see that might be difficult and we will try to accommodate. The schedule is not finalized, but we do need to keep things moving so we can meet the required early November Phase B start date. This would give 37 months for Phases B/C/D. Compared to Discovery's 36 months for Phase C/D, you can see we are already compressed. (Comment from the floor: It seems like a good trade to use a weekend to save a week.)

QUESTION: Could we use 2 weekend days to count as 1 business day?

ANSWER: We'll have to work on this.

QUESTION: In terms of the implementation approach and refining our costs. Can you do something about tightening up that \pm \$30M on the ELV envelopes?

ANSWER: Sorry, we know that is difficult. But we don't know what the ELV providers will bid and if we tighten up those envelopes we may make one launch option look better than another and that would be unfair to their competition. The numbers we give capture the whole, likely range of costs.

QUESTION: But the proposers may select based on the cost groupings?

ANSWER: Yes. This is the safer way to deal with uncertain costs. We know it is difficult for you, but it is probably worse the other way.

There were no additional questions. Perry reminded the teams that the questions and answers would be posted on the web. He congratulated the teams again and the meeting was adjourned at 11:50.