

2006 Discovery AO Proposal Memo

To: Discovery Design Team
From: Wu, Chris
Date: January 2006
Re: Proposal Team Kick-Off Meeting

Good afternoon team. Next week we will be holding our kick-off meeting for the 2006 Discover proposal team. Though our design team consists of some of the brightest engineers in the company, I know that most of you have never participated in such a high-profile project. As the project systems engineer, I will outline the steps that we need to take as a team during the first two weeks in order to ensure our success.

The Principle Investigator (PI) and their science team have already determined the mission needs, goals, and objectives for this mission. As a strategic move, our company has already performed a mission scoping exercise and developed a concept of operations (CONOPS). All this makes our job a bit easier, and our task will be to come up with a design that maximizes our chance of winning this AO. The proposal deadline is April 5.

Due to the extremely tight proposal schedule, I would like to begin the design process by having each team member closely review the pre-developed mission scope and CONOPS before the meeting. I have attached these documents with this memo. It is important for each team member to understand the full scope of the mission while keeping in mind the design impact of each member's respective subsystem. Each of you has a specialty skill in developing spacecraft subsystems, and you will have to leverage this skill with a broader understanding of what our mission is trying to accomplish.

Note that not everyone will be a subsys eng. Your team would also include specialists in risk, science, cost plus other sys engs.

good solid intro

may also want them to be familiar w/ the AO

Our first deliverable will be to draft project-level requirements for the mission. These requirements will establish the guidelines for how we pursue our design, and should be derived from the mission scope and CONOPS that have already been established. I would like to have this completed within a week after the meeting. Concurrently, we will be compiling a list of constraints and assumptions that we will have to make during the requirements drafting process.

good.
Also derived from AO constraint like LV which sets mass & volume.

Following the process of drafting high-level requirements, we will divide the design team into multiple teams of less than 10 people with individuals from diverse subsystem backgrounds, and ^{& other specialties too} perform parallel brainstorming sessions. The goal during this phase will be to incorporate the requirements that we have drafted into creating candidates for preliminary design concepts. Each of you should already have a very clear picture of the mission, after having accomplished the requirements drafting process, and be able to develop suitable concepts accordingly.

very good

During the brainstorming phase, I also encourage everyone to research heritage designs. However, I must place caution in adopting excessive heritage unless the design has a high level of similarity in requirements that meet our needs. Adopting heritage can potentially reduce our costs, but adopting the wrong designs can cause more problems than benefits.

May want to add that any recommended heritage will have a separate review

At the end of the two week mark, I wish to have a detailed product breakdown structure and refined requirements documents created. As we iterate through the preliminary design concept and brainstorming sessions, we may also be redefining our requirements, constraints, and assumptions.

probably not subject to redefinition

Keeping an open mind will be important during this entire process, and consistent communication between team members and subsystem teams will be crucial in making sure we make forward progress.

may be too much with all the above work going on too

Our activities during these first two weeks will lay the foundation for the rest of our proposal work.

After coming up with several preliminary design candidates, we will evaluate them against the requirements, constraints, and assumptions and select the most suitable design. Most of the major design decisions will be made during these two weeks, and the subsequent work will be increasing the level of fidelity of our proposed design solution. After we create a baseline design we will perform functional analysis for each subsystem and continue to increase the level of design detail. The ultimate goal of our team will be to show the feasibility and attractiveness of our design while meeting the Discover AO guidelines. — *yes, don't forget about cost cap.*

I congratulate all of you on being selected for this proposal team, and I am sure that each of you will be valuable contributors to our design. I firmly believe in the importance of open communication, so please feel free to express any concerns or ideas that any of you might have throughout the entire design process. I look forward to meeting all of you next week.

Chris Wu

Project Systems Engineer

good job on this!

how about figures of merit.

who will make the decision

one of the key criteria for picking concept and proposing it is whether it can be done for \$X.

good