

Discovery 2019
Concept Study Step-2 Questions & Answers

Change Log		
Rev.	Date	Description of Changes
01	03/23/2020	Added Q&As 1-8
02	04/01/2020	Revised Q&A 3 and added Q&A 9-30
03	04/13/2020	Deleted Q&A 30 and added Q&As 31-33
04	06/03/2020	Revised Q&A 32 and added Q&As 34-36
05	06/15/2020	Revised Q&A 14, 32 and 33
06	07/09/2020	Added Q&As 37 and 38
07	07/14/2020	Added Q&A 39 and 40
08	07/23/2020	Added Q&A 41 – 43
09	08/12/2020	Added Q&A 44
10	09/03/2020	Added Q&A 45 – 47
11	10/08/2020	Added Q&A 48 – 49
12	10/22/2020	Added Q&A 50 – 52
13	12/03/2020	Added Q&A 53

Q1: Will there be a separately scheduled PI Forum?

A1: No, there will not be a one-day PI Masters Forum as described in Section 7.4.3 of the AO. Some elements of previous PI Forum meetings will be incorporated into the kickoff meeting on March 25, 2020.

Q2: Is there a cap on dial-in participants per team for the Kickoff and debriefs on March 25 and 26?

A2: There is a cap of 25 per team for both.

Q3: What format should be used to submit the requested plans for addressing significant weaknesses, as stated in the selection letter?

A3: ~~Submit a table with brief plans by May 1, 2020. The goal of this process is to allow evaluation managers to see your approach and ensure that no key points are missed.~~ The plans requested in the selection letter are no longer required.
(Updated 04/01/2020)

Q4: Will funding profiles be provided by NASA for the CSRs to follow?

A4: No, at this time, there will not be specific funding profiles to follow but this may change. Teams will submit funding profiles as required in the CSR guidelines and criteria document. A funding profile may be provided by NASA later in the process, and you will be expected to match it as closely as possible.

Q5: Is a team allowed to plan a launch window in between the two specified launch windows?

A5: No. Teams must use the specified launch windows.

Q6: Can papers published during the CSR be considered? What if they are published or submitted AFTER the CSR is submitted?

A6: Papers submitted or published prior to the CSR submission deadline can be referenced in the CSR. Papers submitted or published after the CSR deadline will be considered as part of the site visit process.

Q7: How much outreach and education plan should be in the CSR?

A7: Section 5.5.2 of the AO states “NASA may impose Education Program requirements during or subsequent to Phase A, and will negotiate any additional funding necessary to meet these requirements.” At this time, an Education Program is not required in the CSR. The same section of the AO also states that a Communications and Outreach Plan will be required in Phase B, so this also

should not be part of the CSR, but will need to be submitted soon after downselection.

Q8: Is the Student Collaboration (SC) incentive to be funded through Phase D or Phase F? Doesn't this penalize missions with longer cruise phases if the funding must be spread out?

A8: The Student Collaboration incentive has been changed to 1% of the total PI-Managed Mission Cost (PIMMC), including Phases A through F.

Q9: The 2018 SMD Policy Document (<https://science.nasa.gov/student-collaborations>) concerning Student Collaborations (SC) says "Proposers shall be asked to revise the SC if estimated costs exceed the SC incentive or shall specify alternative funding sources for the difference (typically coming from the PI-managed budget)." Can reserves be used to complete the SC effort if it needs additional funding, if the reserves are not needed for other parts of the mission?

A9: If reserves are encumbered in the CSR for the SC, the source of reserves funding must be identified, and required unencumbered reserves must be maintained for the Baseline Science Mission. During development and operations, project unencumbered reserves may be used with approval of Program and project leadership, but this would occur beyond this Step 2 evaluation.

Q10: Can an instrument developed under a Student Collaboration (SC) or Technology Demonstration Opportunity (TDO) have a different risk classification than the baseline payload? For example, can an SC instrument be Class D for a mission with a main science payload that is Class C?

A10: In this case, the SC or TDO instruments may be Class D, as long as the SC or TDO is separable from the main mission. The TMC panel will produce findings on whether or not an SC or a TDO is separable, including the potential of failure impacting the Baseline Science Mission.

Q11: Can the \$20M incentive for Technology Demonstration Opportunity (TDO) be used to cover the cost of accommodating the TDO?

A11: Yes, accommodation of the TDO may come from the incentive.

Q12: Are Technology Demonstration Opportunities (TDOs) to be funded through Phase D or Phase F?

A12: They may be funded through Phase F.

Q13: Can a Technology Demonstration Opportunity (TDO) be contributed?

A13: Yes.

Q14: If a Technology Demonstration Opportunity (TDO) is contributed and the accommodation costs are zero, may a project use the \$20M incentive as part of the PIMMC?

A14: ~~No. The amount of the TDO incentive amount is based on estimated costs to implement the TDO; described in Section K of the CSR, up to \$20M. If the cost to the project for the TDO is zero, then the TDO incentive is also zero.~~

See details in revised CSR Guidelines (*Updated 06/15/2020*)

Q15: Is the \$20M incentive for a Technology Demonstration Opportunity (TDO) a total amount or per TDO?

A15: Per TDO.

Q16: Will the technology incentive table—Table 4—from the AO be revised based on the presentation from the Space Technology Mission Directorate (STMD) at the CSR kickoff meeting?

A16: Table 4 in the AO is a list of mission-enabling technology and remains the same.

Q17: Can a Science Enhancement Option (SEO) be based on a Technology Demonstration Opportunity (TDO)?

A17: SEOs and TDOs are intended to be separate categories. In fact, Section 5.1.6 of the AO states that flight hardware may not be proposed as an SEO. The AO does not specifically forbid SEOs based on TDOs, but please note that the SEOs and TDOs are evaluated separately, with separate forms from those evaluating the prime mission. SEOs and TDOs may or may not be selected in the downselection of a mission, so an SEO based on a non-selected TDO would not be part of a mission.

Q18: Do staff running the Science Enhancement Option (SEO) and Technology Demonstration Opportunity (TDO) need to be named as Co-Is?

A18: Leaders of SEO and TDO efforts must be included as Co-Is and all persons involved must be included in the conflicted parties list as their participation affects conflict-of-interest determinations for evaluator selection.

Q19: What is the due date for the list of conflicted parties?

A19: August 19, 2020 is the due date for the conflicted parties lists. The wrong date was presented at the kick-off. The presentation has been corrected and was re-posted to the website: <https://discovery.larc.nasa.gov/phaseAconcept.html>.

Q20: From Requirement CS-32, what is meant by the statement “Launch mass not available to the proposed mission”?

A20: The [Guidelines and Criteria for the Phase A Concept Study](#) document will be amended to use the same statement “Launch Mass not useable by the proposed mission” as in AO Requirement B-35. Launch mass would be considered unuseable if the mass of the investigation is constrained in any way that precludes the use of the launch mass. For example, even at maximum propellant load, some of the launch mass may not be useable by the Baseline Science Mission.

Q21: Will the environments given by LSP envelop the future vehicles being considered?

A21: Not necessarily, as these have not been assessed for the Discovery missions. Consult with the LSP point of contact if there are specific questions about the new launch vehicles that may be available.

Q22: Are benchmark cost modeling files not required at all, or just in the appendix?

A22: Benchmark cost modeling files were required in Step 1, but are not required in Step 2 due to the reconciliation that can occur as part of the Site Visit process. However, Section L.17 of the CSR guidelines and criteria document states that “analogous files for any publicly available cost model may be included on each submitted CD/DVD, if accompanied by discussion in this appendix.” This information would be submitted in Appendix L.17.

Q23: Does the evaluation team have access to the Step 1 weaknesses and strengths?

A23: No, the evaluation team will not have access to the Step 1 weaknesses and strengths, although the Program Scientist and SOMA Acquisition Managers will have access and can confirm whether or not the Step 1 weaknesses were addressed in Step 2. CSRs may include Step-1 findings, to provide context for those efforts made during the concept study to address them.

Q24: Does the new Risk Management Factor C-6 address the Project's risk management approach, specific risks or both?

A24: The emphasis is on the risk management approach, but evaluators will be asked to consider specific risks identified as they relate to the risk management approach.

Q25: Is there a range limit for a Mars gravity assist for Planetary Protection categorization??

A25: No, there is not a specific range limit and teams are encouraged to correspond with NASA's Office of Planetary Protection to determine appropriate Planetary Protection approaches for their individual investigation.

Q26: What is a Planetary Protection (PP) Mission Category II*?

A26: II* is a category that acknowledges the need for more information on destinations that might warrant bioburden protection in the future.

Q27: How is Planetary Protection (PP) applied to a Technology Demonstration Opportunity (TDOs)?

A27: TDOs are subject to the same PP requirements as the rest of the mission.

Q28: Are teams expected to consult with the Office of Planetary Protection (OPP) for their target classification for the CSR?

A28: Yes, teams are expected to send the OPP their plans and include relevant information received from OPP with their Concept Study Report.

Q29: What are "activities associated with social or educational benefits (if not incorporated in any of Phases A through F)" described in Requirement CS-78?

A29: These are outreach communications and education plans. They are not required, but if included, they can be covered under the PIMMC or can be contributed, in which case their cost would be listed in the second half of Cost Table 1.

~~**Q30: Will NASA's Space Technology Mission Directorate (STMD) pay for a Deep Space Atomic Clock (DSAC) flight unit, or is that out of the PIMMC?**~~

~~A30: Proposers interested in DSAC should contact Badri Younes (badri.younes-1@nasa.gov, 202-358-2020) and Jeffrey Sheehy (jeffrey.sheehy@nasa.gov, 202-358-1177) at STMD directly for more information. (deleted 04/13/2020, superseded by Q&A 32)~~

Q31: Can a Concept Study Team create a public-facing website to explain the prospective mission to the general public? Are there guidelines for such a website? Is there a point of contact at NASA Headquarters who can advise us as we create the site?

A31: NASA is discouraging the creation of any new websites while the digital strategy for the agency is being developed. If you choose to create a website about your concept study, you may not use your NASA funding for these activities and are asked to comply with the following guidelines:

- a. NASA name and emblems should not appear on website banners.
- b. Websites should not be lobbying efforts aimed at affecting Step-2 selection.

- c. Content should accurately portray the status of the mission concept with regards to the selection process.
- d. Contact alana.r.johnson@nasa.gov or joshua.a.handal@nasa.gov at NASA Headquarters with detailed questions.

Q32: How do we propose *mission-enabling technology infusion and* TDOs involving technologies supported by NASA's Space Technology Mission Directorate (STMD)?

A32: CSRs with mission-enabling *technology infusion and* TDOs employing STMD-supported technology must also include a letter of commitment from STMD, as described in the revised CSR Guidelines (*Updated 06/15/2020*). ~~The letter should include cost estimates and commitments for development and integration. The PI will be responsible for ensuring timely, accurate work of subcontractors, including NASA Centers, to meet TDO milestones.~~ Concept Study teams should work with the POCs listed below for each technology, including both the technology leads and the specific STMD program staff.

Mission-enabling Technology Infusion:

- HEEET Venus Probe
 - Technology leads: Raj Venkatapathy (NASA Senior Technologist for Entry System Technologies, ARC, ethiraj.venkatapathy-1@nasa.gov) & Michelle Munk (NASA EDL System Capability Lead, michelle.m.munk@nasa.gov)
 - STMD Program Staff: Niki Werkheiser (Game Changing Development, STMD, niki.werkheiser@nasa.gov); Jeff Sheehy (Chief Engineer, STMD, jeffrey.sheehy@nasa.gov)

TDOs:

- Deep Space Atomic Clock
 - Technology lead: Todd Ely (JPL PM, todd.a.ely@jpl.nasa.gov)
 - STMD Program Staff: LaNetra Tate (Technology Demonstration Missions, STMD, lanetra.c.tate@nasa.gov), Jeff Sheehy (Chief Engineer, STMD, jeffrey.sheehy@nasa.gov)
- Extreme Environment Solar Power
 - Technology leads: Fred Elliott (GRC, PM, frederick.w.elliott@nasa.gov); Jeremiah McNatt (GRC, Technology Lead, jeremiah.s.mcnatt@nasa.gov);
 - STMD Program Staff: Niki Werkheiser (Game Changing Development, STMD, niki.werkheiser@nasa.gov); Lee Mason (Deputy Chief Engineer, STMD, lee.s.mason@nasa.gov)

(Updated 06/03/2020)

Q33: For STMD TDOs, does the \$20M incentive apply over and above the STMD contributed value?

A33: ~~The TDO incentive of up to \$20M applies over and above the STMD contributed value. Q&A #14 clarified that the TDO incentive amount will be the project's cost to implement the TDO after any contributions (from STMD or other), up to \$20M.~~

See details in revised CSR Guidelines (*Updated 06/15/2020*)

Q34: If there are changes in key mission personnel on a selected Discovery mission (for Phase A CSR), what method of communication of such changes is required by HQ during the Phase A process and what level of depth of information is recommended?

A34: Changes in key mission personnel must be communicated via e-mail to the Program Scientist with a brief explanation of the change. If SMD identifies any issues with the changes, the PI will be notified within two weeks.

Q35: CSR Structure and page limits (p. 14 of Phase A guidelines) says “130 pages; plus 2 pages for each separate, non-identical instrument or flight element;” for Sections E-I. If there is just one flight element, does that nevertheless mean +2 pages?

A35: Two additional pages may be used for each separate, non-identical instrument or flight element including the first one. If there is only one flight element, the CSR may have 2 additional pages for that flight element.

Q36: Subsection E.5 requires a “Data Plan” while Appendix L.5 is titled “Data Management Plan.” There is significant overlap in the content requested in these two sections. Is there additional guidance on the difference between the content of E.5 and Appendix L.5? Or is it appropriate to only provide an overview in E.5 and refer to Appendix 5 for details? Would the same apply to the Cartography Plan required in Requirement CS-23 for inclusion in Section E.5 and Appendix L.10?

A36: There is specific detail in E.5 that needs to be addressed in Section E, including meeting the requirements of *NASA Plan: Increasing Access to the Results of Scientific Research* (see the program library on the acquisition website at <https://discovery.larc.nasa.gov/dpl.html>), as well as providing a complete description of the mission's Science Implementation that flows through all the subsections in Section E. Identical information does not have to be presented in both sections E.5 and the Appendices L.5 and L.10. Sections may refer to the appendices for more detailed information.

Q37: Some SEOs may require significant effort to produce a high-fidelity cost estimate, which distracts the team from the Baseline mission study. Is it acceptable to present the science case plus a rough cost estimate, essentially proposing to study the SEO in more detail in early Phase B if selected?

A37: A high-fidelity cost estimate is not required for SEOs. Requirement CS-80 in the Guidelines and Criteria for the Phase A Concept Study requires, in Section K, a one-page cost summary (Cost Table Template 7) for a proposed SEO as well as estimating techniques used to develop the cost estimates. Requirement CS-80 also requires the cost to be included as a line item in Section J, Cost Tables 3a and 3b, with the amounts “expanded by WBS as applicable.” If the WBS expansion is not applicable to a proposed SEO, it would remain as a single line item in Cost Tables 3a and 3b. Also, Section 5.1.6 of the AO states “the decision may not be made at the time the baseline investigation is down-selected for flight...The process for deciding on SEO activities may involve further reviews...” and more detailed cost information may be requested at a later time, should the SEO be considered for selection.

Q38: Does the CSR require a full costing of the TDO, including accommodations costs on the host mission, TDO mission execution costs, and TDO payload development costs? Would the costs to accommodate the TDO be sufficient?

A38: Just citing the costs to accommodate the TDO would not be sufficient, and the CSR is required to have a cost estimate of all TDO activities. See Requirement CS-80 in the Guidelines and Criteria for the Phase A Concept Study for details. It states, “This section shall also provide a cost estimate for performing any SEO and/or TDO activities, including technology development.” However, a high-fidelity cost estimate is not required, and CS-80 only requires a one-page cost summary (Cost Table Template 7) for a proposed TDO, including a discussion of the techniques used to develop the cost estimates. Please note the other requirements of CS-80, including requirements for the letter from the sponsoring organization of contributed TDOs. This letter must also address the cost estimates of the TDO, including technology development.

Q39: Is there any possibility of delaying the CSR due date by up to 1 month? The COVID-19 situation, with its associated lack of in-person communication, has greatly impacted team interactions. Even a small amount of additional time would help to relieve some of the unprecedented pressure so that we can deliver the highest quality CSR possible.

A39: The CSR due date will be maintained at this time. However, we appreciate the strain placed on team interactions and will continue to assess COVID-19 impacts. We will reevaluate the due date in early September-2020.

Q40: Given that printing and reproduction facilities might remain difficult to access due to COVID-19, would it be possible to switch to electronic-only submission?

A40: Yes, and we plan to amend *Guidelines and Criteria for the Phase A Concept Study* to reflect this change in the coming months.

Q41: Instead of one 8-hour session, the site visit will be two 6-hour sessions. Is the extra time added to compensate for the inefficiencies associated with a virtual site visit or do you have something specific in mind for this additional time?

A41: The duration for presentations and interactions of the site visits will be 8 hours total, with an additional 15 minutes for any proposed Student Collaborations. The nominal 6-hour per day duration includes additional time for breaks and allowance for any delays caused by connectivity issues. More details will be provided closer to the site visit dates.

Q42: There appear to be some errors in the references to appendices in the *Guidelines and Criteria for the Phase A Concept Study*, specifically in Requirements CS-1, CS-7, CS-16, CS-17, CS-28, CS-31, CS-37, CS-58, and in the Page Limits column on page 14. Should the appendix numbers above L.15 in these requirements be incremented by 1?

A42: Yes, they should be renumbered, and thank you for bringing these errors to our attention. We have corrected these appendix numbers in the latest version of the *Guidelines and Criteria for the Phase A Concept Study*.

Q43: After reading the answer to Q39 we are concerned that NASA is planning to delay the CSR due date and the remainder of the process. Is this the case? If so, we would like that information now so that we can plan accordingly.

A43: No, NASA is not planning to delay the CSR due date or the Discovery 2019 AO Step-2 selection. All planning underway for the CSR review and other processes assumes the current due date. However, given the magnitude of COVID-19's impacts, we will do an assessment in mid-September-2020 of near-term events in the Discovery 2019 AO timeline. Our goal is to remain on schedule, but the health and safety of all participants is paramount to the process.

Q44: At an in-person site visit, we provide the phase A documentation – ICDs, requirements documents, management plans – for the reviewers to examine if they wish. Will there be an opportunity to do this at a virtual site visit?

A44: There will be an opportunity to provide these documents electronically to the panel for the virtual site visit. More detailed instructions will be provided closer to the site visit dates.

Q45: If a proposer wishes to start the Bridge Phase well after downselection, perhaps as much as 2 years later, can the deadline for the Bridge Phase proposal be delayed up to an equivalent amount of time?

A45: No, the Bridge Phase proposal is still needed on schedule because NASA will need to start interacting with the team soon after the downselect. See the

Guidelines and Criteria for the Phase A Concept Study for specific details on due dates.

Q46: The Discovery 2019 AO says, “Estimated NASA Center Management and Operations (CM&O) overhead costs must also be included within the PI-Managed Mission Cost...” Please confirm that CM&O does not need to be included in items that are not within the PIMMC such as Student Collaborations (SCs), TDOs, and SEOs.

A46: The CM&O costs related to incentives for SCs and TDOs and all costs for SEOs would be outside of the PIMMC but need to be included as part of the Enhanced PIMMC (E-PIMMC).

Q47: Are details on the site visit available? We would like specific information on matters such as acceptable web-conferencing solutions.

A47: The Discovery Evaluation Plan covers many of these details and will be published soon. In addition, we will send a letter with detailed instructions well before the site visit.

Q48: Will the two-day virtual site visits be on consecutive days?

A48: Yes.

Q49: Can reserves be added to an SEO budget?

A49: Yes, the SEO budget is outside of the AO Cost Cap, and may include any reserves specifically applied to the SEO.

Q50: AO Requirement 39 says "If use of NASA's network services beyond the capabilities and capacities described in the NASA's Mission Operations and Communications Services document is proposed, the proposal shall include a Letter of Commitment from the NASA network provider; the Letter should confirm the ability of the network to provide the required capabilities and capacities and shall include an estimate of the additional costs for these capabilities and capacities." Requirement 39 seems to clearly indicate that costs that are not narrowly interpreted as “DSN Aperture Fees” as mentioned in AO Requirement 37 but are well within the capabilities and capacities described in the NASA's Mission Operations and Communications Services (MOCS) document, do not require a letter or inclusion of additional costs to the PIMMC. Please clarify that this is the correct interpretation of these requirements.

A50: For the CSR, Requirement CS-81 in the CSR guidelines and criteria must be followed. It states that all CSRs that use NASA's network services will require a Letter of Commitment (LOC). The costs for services, as described in the LOC, including the cost of any development but excluding DSN Aperture Fees, shall

be included in the PIMMC. LOCs discussed in Requirements 37 and 39 in the AO are for Step-1 proposals.

Q51: During the site visits, when will TDOs be addressed?

A51: Any TDO overview presentations and responses to TDO-related SQRLs will be part of the main presentation/discussion time, or incorporated into the optional tour/demonstration time of the site visit. There will not be additional time allotted for TDOs.

Q52: I understand that for the TDO proposal in Appendix K we are allowed 25 pages. Do we also get a cover page and a TOC page in addition to these 25 pages?

A52: No, each TDO in Appendix K is limited to a total of 25 pages.

Q53: Does appendix *L.4 Phase B Contract Implementation Data* need to address work performed by NASA Centers?

A53: For work performed by a NASA Center, Appendix L.4 should include the following items:

1. Brief description of the work, sufficient to determine the WBS structure that will need to be established, *e.g.*, instrument, subsystem, science team, etc.
2. ROM cost estimate for Phase B, broken down by FY, to prepare for funding disbursement.

This requirements applies to all mission concepts that include work by a NASA Center.