

SALMON-2 AO JUICE PEA Q&A

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The JUICE Program Library may be found by selecting "Program Library" at <http://soma.larc.nasa.gov/juice/>.

Other questions may be addressed to Dr. Curt Niebur, JUICE NASA Program Scientist, curt.niebur@nasa.gov. Questions (which may be abridged for brevity and paraphrased to ensure anonymity) and answers will be posted at the above URL once a week.

Questions dealing with the ESA AO should be submitted to ESA program officers, juice@rssd.esa.int, and are posted at http://sci.esa.int/juice_ao.

Log of Questions

July 19, 2012: Q-1, Q-2, Q-3, Q-4, Q-5, Q-6, Q-7, Q-8, Q-9, Q-10

July 25, 2012: Q-11

August 3, 2012: Q-9 updated (indicated by text in **blue bold**), Q-12 through Q-20

August 8, 2012: Q-21 through Q-25 added

August 16, 2012: Q-26 through 29 added

August 30, 2012: Q-30 through Q-32 added

September 12, 2012: Q-33 added

Q-1 NSPIRES requires that I provide a proposal start and end date, but the latest end date available is December 31, 2020. What do I do if my investigation will last longer than that?

Please enter an end date that is one day after your start date to indicate that the true end date is beyond 12/31/2020 and is specified within the body of your proposal.

Q-2 In the category of 'NASA-funded instrument investigations led by a U.S. PI' are there any PI experience requirements? I couldn't find any in the boilerplate SALMON-2 AO or in appendix K. I appreciate that the PI and management team's experience have a large bearing on the selection process, but I wondered if there were specific experience requirements for the PI? In the past there have been PI requirements (having previously served as a deputy PI or PI on another instrument, etc.), but I seem to recall them being for whole missions not just for instruments.

No requirements for specific PI experience are stated in the SALMON -2 AO or PEA K. However, SALMON-2 Section 5.4.3 states that "The qualifications and experience of the PI, PM, Project

Scientist (PS), Project Systems Engineer (PSE), Project Manager Alternate (if named), and other key members of the PI-led Investigation Team must be commensurate with the technical and managerial needs of the proposed investigation.”

SALMON-2 Requirement 43 states “Proposals shall identify the management positions that will be filled by key management team members. These positions shall include, at minimum, the PI, PM, PSE, Project Manager Alternate (if named) and, where appropriate, the PS and partner leads, especially partner leads for substantial efforts. For management positions, for which key management team members are named (including the PI and PM per Requirements 32 and 33), proposals shall describe the qualifications and experience required of any candidate to occupy those positions. For all positions that will be filled by key management team members, proposals shall demonstrate that the described qualifications and experience are commensurate with the technical and managerial needs of the proposed investigation.”

Q-3 So - just to be clear - if I am a Co-I on a European instrument that gets selected will my budget automatically be approved? Or is there another step after that?

Participation on a selected non-U.S.-led team is not a guarantee that NASA will select your contribution for funding. All three types of NASA contributions (1) NASA-funded instrument investigations led by a U.S. Principal Investigator (PI), 2) NASA-funded instrument component(s) provided to non-U.S.-led instrument(s), and 3) NASA-funded U.S. Co-Investigators (Co-Is) on non-U.S.-led instrument(s) submitted to both the NASA and ESA AOs will be individually evaluated and selected by NASA as part of its total contribution to the ESA JUICE mission, which is not to exceed \$100M (RY) for total life cycle costs.

Q-4 Requirement K-8 says “Proposals shall include integration plans and planning budgets that occur during Phase D and that align with the schedule provided by ESA in the Science Management Plan.” However, the Science Management Plan “ESASPC(2012)20_rev. 1_JUICE SMP.pdf” does not appear to contain a schedule.

Main spacecraft milestones are provided in Section 9.4, “Project Phasing, Planning, and Schedule Requirements,” in the Experiment Interface Document Part A posted on the ESA AO website.

Q-5 The AO states “The inability of NASA to accommodate the requested funding profile may be a reason for nonselection of a proposal.” Please provide the “typical funding profile” that can be accommodated.

NASA has defined the approximate funding profile below for planning purposes only. Although it will be updated after selections are finalized, NASA does not guarantee that significant deviations from the approximate planning profile below can be accommodated.

- Instrument selection through final mission/payload adoption (2012 – 2014): 10%
- Instrument development through delivery (2015 – 2019): 45%

- Delivery through launch and arrival at Jupiter (2020 – 2030): 30%
- Primary Science mission operations (2031- 2033): 15%

Q-6 Does requirement K-16 on the data plan supersede requirement B-21 in the SALMON 2 AO? For the Earth Venture Instrument opportunity, the requirement stated that the AO requirement was superseded, but the JUICE AO does not explicitly address this.

Yes, Requirement K-16 in the PEA supersedes Requirement B-21 in the SALMON-2 AO. Proposals should also identify how they plan to satisfy the policies in Section 4.5.4 of the PEA from the standpoint of hardware, software, personnel, and cost.

Q-7 Requirement K-12 states “Proposals shall describe the instrument’s passivation plans at end-of-mission and identify instrument components anticipated to survive Earth reentry. This supersedes Requirement 39 in the SALMON-2 AO.” This is a leftover from EVI. Since orbit debris is not a significant concern at Ganymede, I suggest that this requirement be replaced with: “Requirements K-12. Proposals do not have to address end of mission requirements. This supersedes Requirement 39 in the SALMON-2 AO.”

Proposals must contain a brief discussion of components anticipated to survive Earth reentry in case of a launch failure and should discuss passivation plans for end of mission.

Q-8 Section 6.3.2 states “Should a non-U.S. proposal, or a U.S. proposal with non-U.S. participation, be selected by NASA, the Science Division of NASA's Office of International and Interagency Relations will arrange...” The “should a non-U.S. proposal...” part may be a generic left over from other PEAs, given you are only asking for US led proposals.

NASA will be considering for selection NASA contributions that are part of non-U.S. proposals submitted to the ESA AO. Although non-U.S. proposals are not strictly part of this solicitation, the NASA and ESA AO processes are tightly coupled, and this language reflects the requirement that NASA’s Office of International and Interagency Relations will arrange the necessary agreements for selected contributions.

Q-9 I am currently hoping to be a Co-I on an instrument with a non-U.S. PI. If this comes to pass, I see from the solicitation that I should respond to the ESA AO as part of the European proposal team. However, even if I am not submitting anything to NASA directly, do I need to contact or inform NASA in any way regarding my potential participation?

You do not need to directly contact or inform NASA of your involvement in a non-U.S.-led proposal submitted to the ESA AO. ESA will provide information on all submitted proposals that contain requests for a NASA contribution(s), such as a NASA-funded U.S. Co-I. [Personnel serving as team members on proposals submitted to the ESA AO were not required to submit an NOI to NASA describing their role on the proposal.](#)

Q-10 Is the Salmon-2 AO just for JUICE or is it open to all missions of opportunity proposals?

The SALMON-2 AO provides NASA the flexibility to respond to and participate in space flight missions of opportunity that advance high priority science, exploration, and technology objectives in a standard and expedient manner. Investigations may be proposed in response to specific Program Elements, with Program Elements added by amending the SALMON-2 AO in the form of Program Element Appendices (PEAs). The JUICE PEA released on July 6, 2012, is specifically intended to solicit proposals addressing appropriate science questions relevant to Planetary science and the JUICE science objectives as described in Section 2 of the JUICE PEA.

Q-11 I am considering submitting an NOI for the recent call for US-PI led investigations for JUICE. Does the entire team have to be listed in the NOI? Or can I add some at a later date, to the proposal?

While NASA appreciates the proposers' efforts to provide the best information possible in their NOIs, NASA realizes that this information is not final and subject to change in the submitted proposal.

Q-12 There is a difference in reserve postures expected by ESA and NASA. ESA typically prefers 20%, and NASA prefers 30% (Phases A – D). How much reserve should a US contribution to a non-US-led instrument include?

Since the entire instrument package is being proposed to ESA, the package should minimally meet ESA's requirements. However, since the US component will also be judged by NASA and NASA standards, a larger reserve posture would be expected on NASA-funded developments.

Q-13 How much radiation shielding can we assume that the bus provides the instruments?

ESA has posted a variety of questions and answers on this topic under the "Q&A" link at http://sci.esa.int/juice_ao. Additional information can be found in the Proposal Information Package (PIP) available at http://sci.esa.int/juice_ao.

Q-14 What is the required TRL for U.S. PI-led instruments at the time of the proposal submission on 24 September 2012 and how flexible is this requirement?

Section 5.3.4 ("New Technologies/Advanced Developments") of the SALMON-2 AO states "Proposed science or exploration investigations are generally expected to have mature technologies, specifically all technologies at a Technology Readiness Level (TRL) of 6 or higher (TRLs are defined in Appendix J of NPR 7120.8, NASA Research and Technology Program and Project Management Requirements). Proposals with less mature technologies are permitted as long as they contain a plan for maturing all technologies to TRL 6 no later than KDP-C

(Confirmation) and adequate backup plans in the event that the technologies cannot be matured as planned.”

Requirement 30 of the SALMON-2 AO states “Unless otherwise specified in the applicable PEA, proposals that use technologies currently at less than TRL 6 shall include a plan for technology maturation to TRL 6 no later than KDP-C and a backup plan in the event that the technologies cannot be matured as planned.”

In addition, the funding limit in SALMON-2 AO Requirement 54 is relevant to those proposers considering maturing a technology to TRL 6 by KDP-C (“Requirement 54. No more than 25% of the proposed costs may be incurred prior to KDP-C (Confirmation)”).

Q-15 Is there a reference guide for the maximum mass/volume/dimensions/power of the instrument?

All information on the resources available for proposed information is provided in the ESA Proposal Information Package. EID A, in particular, is useful.

Q-16 When will NASA announce its decision regarding EID-B?

As mentioned at the Pre-Proposal Conference, NASA is considering amending the JUICE PEA to require proposers to include an additional appendix providing EID-B populated with information from the proposed investigation. NASA will announce a decision by 8/10/12.

Q-17 Under the Proposal Structure and Page Limits Table in the SALMON-2 AO (Requirement B-4), the total page limit identified for Sections D, E, F, and G is 35 pages, with the explicit statement that there is no page limit on Schedule Foldout(s). However, the PEA-K JUICE Requirement K-17 states that "proposals are allowed a total of 40 pages for the Science Investigation Experiment Implementation, Investigation Implementation Schedule Foldout, and Management sections (Sections D, E, F, and G)". Since the PEA supersedes the AO, the implication is that the Schedule Foldout now falls within the 40-page limit, whereas in the AO it had been outside of the 35-page limit. As was discussed during the NASA pre-proposal conference, there is concern that this interpretation would reduce the number of pages available for NASA proposers. Is the Schedule Foldout intended to be included within the 40-page limit for Sections D, E, F, and G??

The Schedule foldout still has no page limits.

Q-18 ESA's LOI format did not require naming individuals or institutional partners providing hardware contributions to an ESA-led instrument. How do we establish that relationship for proposal evaluation purposes?

While the LOIs and NOIs submitted to ESA and NASA, respectively, will be valuable in organizing the review panels, NASA realizes that this information is not final and subject to change in the submitted proposal. The final submitted proposals will be used to establish all team members and institutions involved in the proposal.

Q-19 While funding for operations and science co-I's will come at a later date, many science teams are already in place, formally or informally. How will NASA avoid naming these individuals to review panels? Should they be listed as unfunded collaborators?

Funding for science operations should be included in the proposal submitted to NASA. When naming team members on the proposal, proposers should follow the requirements listed in Section 4.3 of the JUICE PEA, Section 5.6 of the SALMON-2 AO , and Appendix B of the SALMON-2 AO. NASA will use its standard practices to avoid conflicts of interest in the review process.

There will be a future competitive opportunity to add additional science team members focused on science operations in the Jupiter system.

Q-20 We understand that are not to include funding for co-I's without hardware roles. (1) For hardware-involved co-I's, should proposal include their science and operations costs? (2) Given the expectation that science funding will be added at a later date, will proposals be evaluated, formally or informally on "adequacy of cost for science?"

Funding for science operations should be included in the proposal submitted to NASA. When naming team members on the proposal, proposers should follow the requirements listed in Section 4.3 of the JUICE PEA, Section 5.6 of the SALMON-2 AO , and Appendix B of the SALMON-2 AO. NASA will use its standard practices to avoid conflicts of interest in the review process.

Q-21 Funding profile data deliveries are different in the NASA and ESA documents. How should proposers address this?

ESA delivery dates must be met by all instruments. Proposers should build their proposed budget to accommodate ESA's due dates.

Q-22 What is the start date for funding NASA instruments?

The selection announcement is expected in the first quarter of CY2013. ESA plans to kick off instrument teams immediately. NASA will need to implement contracts, and the timing of those contracts will depend on the teaming arrangements, and the availability of the SOW and updated cost and pricing data from the teams. Spring of 2013 is the target date if all requirements are met. JUICE PEA K contains additional details.

Q-23 Proposals are being submitted electronically, but will the reviewers later be issued paper copies? This is important because it bears on the effectiveness of using foldouts as part of the submission.

NASA may provide a small number of paper copies of proposals for communal use at plenary meetings of review panels, but NASA does not plan to provide individual paper copies to each reviewer. Reviewers may elect to print copies for themselves.

Q-24 Can you please clarify the allowed roles of Co-Is on proposals submitted to NASA in response to the JUICE PEA? Must one build and deliver hardware to be named as a Co-I?

Section 4.3 of the JUICE PEA states that “Every Co-I must have a role that is required for the successful development of the instrument science investigation, and the necessity of that role must be justified.” The PEA does not define what development of the instrument science investigation involves, and this process is typically more far reaching than simply building and delivering hardware (for instance, development can include requirements definition and definition of the concept of operations). The PI is expected to exercise his/her judgment in organizing the science team and is permitted by Requirement K-4 in the PEA to designate the Co-Is, define their roles, and justify the necessity and relevance of those roles to the development process. Note that the PEA does not restrict Co-Is from having a role beyond the development of the instrument investigation, and in fact participation by Co-Is in the proposal after development is expected.

As stated in the PEA, NASA plans to provide an opportunity to add additional team members to assist with science operations prior to arrival at Jupiter.

Q-25 The Pre-Proposal conference discussed NASA requirements for Co-Is on proposals submitted to NASA. Do these requirements apply to U.S. Co-Is on non-U.S.-led proposals submitted in response to the ESA AO? With restrictions on the size of the science team how does one judge if you have enough scientists to do the work required? If a Co-I is involved in operations should they be identified and listed in the proposal? Where can we find requirements from ESA on the use of Co-Is?

NASA does not levy requirements on the ESA AO process or proposals. Requirements levied by the NASA SALMON-2 AO and JUICE PEA are intended to guide proposals submitted in response to NASA’s solicitation, and they also reflect NASA’s philosophy regarding the need to justify inclusion of Co-Is. As stated in Question 3, simply participating on a non-U.S.-led proposal is not a guarantee that NASA will select your individual contribution for funding, and NASA desires to select a mixture of the three types of contributions it is offering to ESA for the JUICE mission.

Question 24 clarifies the Co-I policy for proposals being submitted to NASA. Requirements from ESA for proposals being submitted to its AO can be found in the documents posted at http://sci.esa.int/juice_ao.

Q-26 What are the dates for the start of Phase A and KDP-B?

Typical life cycle development phases as prescribed in 7120.5 will be tailored for U.S.- led instrument development projects. Some KDPs may not be formally required, though development will be monitored by an independent review team, and reported to HQ as needed. U.S.-led instrument phase and review dates will be determined after contracts are awarded and ESA development and review dates are known. Based on the instrument selection date of February 2013 in the ESA Science Management Plan, the selected proposals will enter a design definition phase (start of Phase A) that leads to an almost complete interface definition by the time of the Preliminary Requirements Review in September of 2013 (equivalent to the NASA Mission Definition Review/System Requirements Review and, subsequently, KDP-B if required). Phase B then starts after approval to proceed. See related Question about contract start dates.

Q-27 I am a US Co-I on a non-US-led instrument. The ESA AO does not describe either the process or the criteria under which NASA will decide whether or not to fund my contribution. Nor does the SALMON-2 AO, which is focused on US-led instruments. What is the process by which NASA will make this decision and what are the evaluation criteria? How will NASA accomplish its review of proposals submitted to ESA without requiring standard NASA proposal formats?

NASA contributions contained in non-U.S.-led proposals submitted to the ESA AO will undergo the NASA review and selection process described in Sections 6.1 and 6.2 of the JUICE PEA and Sections 7.1-7.4 of the SALMON-2 AO. NASA will use relevant evaluation criteria from those sections of the documents to evaluate the NASA contributions contained in non-U.S.-led proposals. While these criteria are not exactly the same as those contained in the ESA AO, NASA has compiled a mapping of the ESA and NASA evaluation criteria from their respective AOs that demonstrates these criteria are exceedingly well aligned. This mapping will be posted at <http://soma.larc.nasa.gov/juice/>.

NASA recognizes that the proposals submitted to ESA will abide by the format and content requirements of the ESA AO, and that these requirements produce proposals not in the standard NASA format. NASA has conducted a mapping of the requirements in the NASA and ESA AO documents (this mapping will be posted at <http://soma.larc.nasa.gov/juice/>) and is confident that the content of proposals submitted in response to these AOs will be similar. NASA is also confident that its review process can accommodate the ESA proposal format.

Q-28 I am writing to suggest to you that NASA consider extending the proposal submission deadline for the SALMON-2 JUICE proposals by three weeks to be the same as ESA's. This would allow additional time to utilize the additional five pages allowed under Requirement 17, to resolve the differences between the NASA and ESA AOs, to resolve ITAR issues that prevent ESA reviewers from seeing the complete proposal submitted to NASA, and to provide the same due date for proposals submitted to both the NASA and ESA AOs and allow the same amount of proposal preparation time for both. (NASA Note: the rationale to support this request has been edited for brevity and clarity)

The solicitation schedule is extremely constrained in order to support ESA's requirement for instrument selection in February 2013, and is further stressed due to the additional complexity arising from the international nature of this opportunity. A delay in the proposal due date cannot be accommodated without delaying the instrument selection.

Proposers are under no obligation to utilize the additional five pages allowed under Requirement 17 of the JUICE PEA. An analysis of the NASA and ESA evaluation criteria, as discussed in Q-27, and the NASA and ESA AO requirements, also discussed in Q-27, demonstrates that NASA and ESA are well aligned and little resolution of the differences is needed. As stated in the AO and at the Pre-Proposal Conference, NASA HQ already has an agreement in place with ESA that allows NASA to provide the entire contents of proposals it receives in response to the NASA JUICE PEA proposal with ESA for its review.

Q-29 Can all or part of the instrument be built by international partners and funded by NASA? Do I/NASA need to have an MOU with the international partner?

As stated in Section 4.4.1 of the JUICE PEA, contributions from sources other than NASA are welcome under certain limitations. Most notable for this question is the limitation that the sum of contributions of any kind to the entirety of the investigation is not to exceed one-third (1/3) of the proposed PI-Managed Investigation Cost.

As stated in Section 6.3.2 of the JUICE PEA, contributions from non-U.S. participants on U.S. proposals selected by NASA will be managed on a no-exchange-of-funds basis. Any necessary formal agreements will be arranged by the Science Division of NASA's Office of International and Interagency Relations after selection.

In summary, an international partner may contribute up to one-third of the investigation's proposed PI-Managed Investigation Cost, but that portion must be funded by the international partner.

Q-30 The Experiment Interface Documents serve as the formal interface control documents between each instrument and the spacecraft, but some of the information contained in the EID-B template is beyond the level of detail available in a typical proposal to NASA. Can you provide guidance on the level of detail you expect to see in EID-B and which parts of the template ESA believes are most critical at the proposal stage? Also, approximately how many pages do you expect EID-B to contain in the proposal appendix?

The EID-B is a direct answer in terms of statements of compliance for each individual requirement given in the EID-A, it details (if needed) the foreseen implementation and contains the description of the interfaces. The timely provision of the details needed in the EID-B is necessary for the

immediate start of the Definition Phase activities with industry. The EID-B addresses several main aspects:

- Design requirements
- Environment requirements
- Technical Interface requirements (including responsibilities for some
- Hardware parts, (e.g., thermal interface...).
- Operations requirements
- Management and programmatic requirements.

ESA plans to end the Phase A with a Preliminary Requirements Review (PRR), which is currently scheduled for September 2013. One of the main objectives of this review is to freeze the interfaces. Therefore instrument EID-B's shall at a level of definition, which is compatible with these objectives. It is expected that the interfaces will be iterated and negotiated between ESA and the PI teams before that, and the EID-B's that are provided at the proposal stage will serve as a starting points.

The size of the EID-B's depends on the complexity of the interfaces and are typically about 40 pages at the proposal stage, and are expected to grow to about 100 pages at the end of the implementation phase (2018), depending on whether detailed interface control drawings are all included or separated from the core document.

The annexes of EID-B should provide the most complete description of all requirements towards the S/C available at the time of proposal submission, including their justification. Not justified requirements will not be taken into consideration.

If a non compliance with respect to the EID-A is expected at the time of writing of the document, the EID-B shall clearly provide the justifications and propose a way forward. Discussions with the ESA study team will then take place to reach a common ground after selection. For the proposal, we acknowledge the fact that the level of details on some part can only be limited, especially where the EID-A is still using TBD (To Be Defined) or TBC (To Be Confirmed). Similarly, we understand that detailed instrument interface drawings may not be readily available.

Due to its importance and use, it is seen as inappropriate to focus the draft EID-B on only a few sections and we recommend addressing the document as a whole, with the view of a long-term interface definition.

Q-31 1.Regarding the requirement for EPO, the PEA says it is required and that requirements 68, 69 and 70 of the SALMON-2 AO apply. Requirement 69 states that "this funding shall be at least the minimum allowable core E/PO program cost." In section 5.7.1 of the SALMON-2 AO, it states "The minimum allowable core E/PO program cost is defined to be 1% of the PI-Managed Mission Cost Cap." Given that the mission cost cap is \$100M, does this mean we are to budget a EPO program of at least \$1M throughout the project? Or is this requirement intended to have

the budgeted/planned EPO program be at least 1% of the estimated costs of the instrument development?

Since the JUICE PEA is soliciting instrument investigations rather than full missions the PEA uses the more accurate term "PI Managed Investigation Cost" in place of the term "PI Managed Mission Cost" used in the SALMON 2 AO. The minimum allowable core E/PO program cost is more accurately defined as 1% of the PI-Managed Investigation Cost, and the PI Managed Investigation Cost is defined in Section 4.4.1 of the JUICE PEA.

Q-32 There is a mismatch between the SALMON-2 PEA and the ESA EID-A concerning the proprietary time for scientists with their data. NASA says no propriety time; ESA says 6 months. Which one should the SALMON-2 PEA PI's follow?

Those proposing to the SALMON 2 JUICE PEA should follow the policies provided in the JUICE PEA and SALMON 2 AO. The Science Data Policy is described in Section 4.5.4 of the JUICE PEA.

Q-33 For each phase of the life cycle until delivery, (from A - D), do we need to indicate the TRL level of the instrument?

Requirement 30 in SALMON-2 states. "Unless otherwise specified in the applicable PEA, proposals that use technologies currently at less than TRL 6 shall include a plan for technology maturation to TRL 6 no later than KDP-C and a backup plan in the event that the technologies cannot be matured as planned."

In Appendix B, Requirement B-27 defines what information needs to be provided by the proposer to substantiate that the TRL level at proposal time, is TRL 6. If it is not TRL 6 at proposal time, the requirement B-27 defines what information needs to be provided to meet requirement 30 which says "include a plan for technology maturation to TRL 6 no later than KDP-C...."

The requirement B-27 does not specifically say that the TRL level of the instrument must be indicated for each life cycle Phase. Instead, it has more general statements such a stating that the following " descriptions shall address, at a minimum,""The proposed approach for maturing each of the identified items to a minimum of TRL 6, defined as "model or prototype demonstration in a relevant environment, space, or ground" by the end of Phase B (include discussion of simulations, prototyping, systems testing, life testing, etc., as appropriate).

It is incumbent on the proposer to read and comply with all of Requirement B-27.