

Entry Systems Technology Research and Development (ESTRAD)
NNA14503443R
Questions and Answers – SET 2
September 19, 2014

- Q.1 Will the contractor staff at the STAR Lab be transferred to ESTRAD?
- A.1 There is no plan to transfer the duties of contract supports of the STAR lab onto the ESTRAD contract.
- Q.2 The DRFP refers to the preparation of slides for some sections of the proposal. Is it NASA's intent to have orals associated with the use of slides?
- A.2 Please review the solicitation because parts of the Mission Suitability and Past Performance proposal will be oral.
- Q.3 What are the names and titles of the presenters?
- A.3 AnJennette C. Rodriguez, Contracting Officer (JAI)
David Hash, Chief of Aerothermodynamics Branch (TSA)
Dean Kontinos, Chief of Entry Systems and Technology Division (TS)
Tom Squire, Deputy Chief of Thermal Protection Materials Branch (TSM)
Jessica Koehne, Physical Scientist for Entry Systems and Vehicle Development Branch (TSS)
- Q.4 Do you have a Center for Nanotechnology?
- A.4 There is no longer a NASA Ames Center for Nanotechnology. Code TSS supports nanotechnology requirements.
- Q.5 How often is the Arc Jet used?
- A.5 For ESTRAD, use of the Arc Jet facility for ESTRAD requirements varies throughout the year. Task orders issued will define the requirements and if the Arc Jet facility will be used.
- Q.6 Do you need to notify the Power Company when you turn it on?
- A.6 It is no longer required.
- Q.7 Do you put in reference tests first?
- A.7 We generally run a calibration series to define the operating point(s) for a test. This involves calibration units of similar size and shape (if possible) as the test article, defining the measurable quantity of heat flux and surface pressure and enthalpy for the test. There are times in which we have run a dummy sample to confirm if the arc operating conditions will achieve the requested surface temperature.
- Q.8 How often do you run the tests?
- A.8 See response to Q. 5. For information purposes only, the average is two tests per day for a particular test series. If we have to install, test, and change a complicated model with much internal instrumentation, then once a day or once every other day may be more normal.

- Q.9 What is the diameter of the test article?
- A.9 Diameters can vary from 1-inch to 15-inch. It depends on the requirements and objectives of the test.
- Q.10 How many articles do you test in a year?
- A.10 Using an average of 200 test days, two tests per day and nominal two models per test, a reasonable estimate is 800 articles per year.
- Q.11 What are you matching? What variables are you trying to reproduce/match?
- A.11 It depends on the requirements and objectives of the test. The variables we try to match depend on the needs of the Principle Investigator (PI) and negotiations with the NASA test engineer(s). The variables may include cold wall heat flux, surface pressure, integrated heat load, and surface temperature.
- Q.12 Do you do calibration?
- A.12 See response to Q.7. Generally we do run a calibration series to ensure arc operating conditions will yield the agreed upon result on the test sample. Task orders will define if required.
- Q.13 What is the maximum temperature you use? Heating rate?
- A.13 The temperature depends on the necessary enthalpy and pressure to achieve proper conditions on the test sample. The values of temperature will correspond to dissociated air at enthalpies from 500 Btu/lb to 25,000 Btu/lb. Heating rates will depend on target entry conditions and model size, but can go from a low of 5 W/cm² to over 1600 W/cm².
- Q.14 Do you ever mix the gases to see what the planetary atmosphere might look like?
- A.14 In the past we have generally run air, Nitrogen, Argon, and Hydrogen/Helium mix for tests of the Galileo probe. Now we add N₂/O₂ mix with wide range of O₂ (0 to 30 percent) and soon CO₂.
- Q.15 Do you ever test objects that have fire/burning?
- A.15 Most tests occur at low pressures in vacuum so this is not an issue. We will ensure combustible models will be cool enough to prevent burning when venting the test cabin to atmosphere. MSDS sheets and pretest analysis is required to determine if any possible combustion might occur during or after the test.
- Q.16 Did you get any data in support of the recent mars entry?
- A.16 A series of tests have been recently conducted in support of post flight analysis of the MEDLI (MSL Entry Descent & Landing Instrumentation) data. The results will be reported at the AIAA SciTech 2015 meeting in Kissimmee, Florida in January.

Q.17 How many kilowatts are roughly tested?

A.17 We deposit a set energy into a fixed volume, 930 MJ/cu. meter (1.2 MJ into 1.3 L). Driver energy of 1.2 MJ, energy impulse of 10 GW (1 MJ delivered over 100 micro sec), or maximum instantaneous current/voltage of 40 kV/1.2 MA.

Q.18 Can you run test after test or does it take time to re-arm?

A.18 A maximum of 3 shots a day is possible due to driver build-up between shots. However, the second and third shots will be "dirty" because the driven tube will not be cleaned and the vacuum pump down will be milli-torr range only.

Q.19 What is the pressure inside when you are testing?

A.19 Driven tube pressures are from 1.0E-7 Torr to 760 Torr test gas, depending on test requirements.

Q.20 How repeatable are the conditions?

A.20 Very repeatable.

Q.21 Does it get loud when you test?

A.21 The shot travels into partial vacuum so sound transmission is very low.

Q.22 Do you need to calibrate? How often?

A.22 See response to Q.12.

Q.23 Do you have MSDS in place?

A.23 Yes. We have binders that contain all relevant MSDS information in the labs. It is the responsibility of everyone who works in the labs to ensure that new materials or chemicals are not brought into the lab unless an MSDS accompanies the materials.

Q.24 Does this contract support this lab?

A.24 The ESTRAD contract will support the Materials Development and Characterization labs.

Q.25 What kind of temperature capabilities do you have?

A.25 For thermal analysis equipment (depending on the instrument) we have the capability of going to 2200C. However, the majority of instruments are run from 1100C to 1600C.

Q.26 How do you do the scale –up of materials?

A.26 We generally work with external vendors and transfer the technology specification to the vendor for scale up. That process involves characterizing material manufactured at both NASA and the external vendor and comparing properties/performance to verify that the vendor's material is consistent with the NASA specifications. Our primary role in the Materials Development lab is TPS development, not scale up.

Q.27 Is everything done in house?

A.27 Depending on the test or property information needed, it may be feasible and more efficient to send material to external vendors for specific testing.

Q.28 What pressure range do you test when you characterize?

A.28 For thermal analysis characterization we test materials from low pressure (near vacuum) to ambient pressure (~1 atm).

Q.29 Do you also work on nozzle liners?

A.29 We do not work directly on nozzle liners; however some of the materials we develop could have potential uses in this area. We have had discussions with DoD on potential collaborations in materials for nozzle liner or similar applications.

Q.30 **RFP B.4 – Page 3 CONTRACT FUNDING** – references Schedules 1 and 2 which have not been previously mentioned. What are Schedules 1 and 2? Is Schedule 1 comprised of 1A, 2A, 3A and 4A and Schedule 2 1B, 2B, 3B and 4B?

A.30 The awarded contract will be incrementally funded. Schedule 1 will reflect the incrementally funding for Phase-in Contract Line Item (CLIN) and Contract Management (CLIN). Schedule 2 will reflect the incrementally funding for the Indefinite Delivery/Indefinite Quantity (IDIQ) (CLINs).

Q.31 **RFP B.6 – Page 4 MINIMUM/MAXIMUM AMOUNT OF SUPPLIES OR SERVICES**

Is the minimum value of \$100,000 mentioned in this clause for CLINS 1B, 2B, 3B and 4B for all 5 years in total, or does it change/increase with the exercise of an option? So conceivably, it's possible for no IDIQ work to be issued for the first 4 years since the minimum amount could be satisfied in year 5?

A.31 The minimum total amount of supplies or services that shall be ordered under CLINS 01B, 02B, 03B, or 04B during the potential effective period of this contract is \$100,000.00 (Estimated Cost and Fixed Fee). The intent is to utilize this contract to support the requirements the organizations listed in the SOW.

Q.32 **RFP G.2. – Page 8 SUBMISSION OF VOUCHERS FOR PAYMENT (NFS 1852.216-870) (MAR 1998)** and **RFP G.8. – Page 16 SUBMISSION OF INVOICE (ARC 52.232-90) (JAN 2012)** There appear to be two clauses discussing invoices/vouchers – G.2 and G.8. Are both correct or is G.8 is where all invoices are sent?

A.32 G.2 refers to the cost invoices and G.8 refers to the process for the fee invoices.

Q.33 How does **G.4 – Page 12 TECHNICAL DIRECTION** relate to **H.2 – Page 17 TASK ORDERING PROCEDURE**? Does G.4 authorize the COR to provide additional direction beyond that provided in H.2 when a Task Order is issued?

A.33 Please see G.4 (d) which requires the Contractor to notify the Contracting Officer if any direction by the COR falls within the categories defined in G.4 (b).

Q.34 **H.3 – Page 16 KEY PERSONNEL AND FACILITIES – this clause lists key personnel and facilities “shown below or as specified in the *contract Schedule*”** Since H.3 is part of the Contract Schedule – where else might the key personnel and facilities be listed?

A.34 The Offeror proposes Key Personnel and facilities in its proposal, the Proposed Key Personnel and facilities will be incorporated into the contract; see H.3.

Q.35 **RFP L.6 – Pages 49-52 PROPOSAL PREPARATION-GENERAL INSTRUCTIONS** The paragraph labeling in L.6 is not consistent with other major sections. Specifically, the predecessor (L.5) and successor (L.7) sections use the format of the second level being (a), (b), etc. The second levels in L.6 begin with (1), (2), etc. until after (8), where it reverts to (c), with no prior (a) or (b).

Please clarify.

A.35 The formatting corresponds to various sections of the solicitation.

Q.36 The solicitation instructions and NFS 1852.231-71 require a total compensation plan from subcontractors who have “non-competitive fixed-price type subcontracts”. Could you please confirm that labor hour or time and materials subcontractors are not require to submit the total compensation plan and compensation data (pursuant both FAR 52.222-46 & NFS 1852.231-71) is only required of the Prime.

A.36 Subcontractors are not exempt from having to submit a total compensation plan if they meet the metrics specified in paragraph (d) of NFS 1852.231-71: (1) they are cost reimbursement or non-competitive fixed-priced subcontracts having a potential value in excess of \$500,000 (so yes, this could include labor hour or T&M subcontracts) and (2) the cumulative value of all their service subcontracts under the prime contract is in excess of 10 percent of the prime contract’s total potential value.

Q.37 Will office space be provided on site for contractor support staff?

A.37 See response to Q.34.

Q.38 What is the existing document management software (ex: Agile, DOORS, etc.)?

A.38 See response to Q.79 of Questions and Answers – SET 1 dated September 9, 2014.

Q.39 Does the facility clearance need to be in place at the time of the proposal, or can it still be “in-process”?

A.39 See response to Q.77 of Questions and Answers – SET 1 dated September 9, 2014.

Q.40 How many years of past performance can be included in the NASA review?

A.40 See response to Q.28 of Questions and Answers – SET 1 dated September 9, 2014.

Q.41 Are there fees or associated costs for contractor staff to take the mandatory NASA training classes?

A.41 See response to Q.55 of Questions and Answers – SET 1 dated September 9, 2014