

Technical Instruction 005  
Reference Statement of Work: Paragraph 2.13

**Task:**

In accordance with Paragraph 2.13 of Section C of Task Order FG01, the Contractor shall perform the following tasks in the areas of Materials and Structures; Aerothermal; and Flight Mechanics Support:

**Materials and Structures Support**

The Contractor shall provide expert analysis and review of reentry heatshield, nosetip, flap (control surfaces) and antenna window material development programs and advanced thermal protection systems. The analyses and review shall include:

- Ensuring that the overall technical approach is feasible and the technical risks are consistent with the goals of the program.
- Recommending improvements where appropriate for fabricating and testing advanced materials which are optimized for cost and/or performance to include: alternate fibers, weave designs, densification procedures, and test specimen & test fixture designs. Recommendations shall be based on reviews of material characterization data, ground test data, flight test data and performance predictions of state-of-the-art materials.
- Ensuring that program plans include the fabrication of necessary material configurations and quantities to support a comprehensive material evaluation process and that proper milestones and selection criteria are established for down select between competing material concepts.
- Ensuring that all the necessary elements of the evaluation process: material characterization, ground testing, flight testing, material modeling, thermostructural analysis and performance predictions are adequately addressed in the overall plan and making recommendations for improving the evaluation process as the work progresses.
- Identifying, at the appropriate stages of the material development/evaluation cycle, the most promising of competing material concepts and recommending further improvements for the next fabrication cycle.
- Preparing presentations and participating in program technical reviews and material working group meetings with sponsors, system contractors, material fabricators, material testers and ground test facility representatives.
- Assisting the NSWCCD Reentry Systems Office (K08) in upgrading the thermostructural analysis capability for advanced composite nosetips in the areas of non-linear constitutive equations, material modeling from characterization data and developing an overall analysis and results interpretation strategy.

### Aerothermal Analysis Support

The Contractor shall provide expert consultation, review, analysis and training to support the NSWCDD Reentry Systems Office (K08) in the areas of aerothermal analysis and design of reentry body thermal protection systems and thermal performance of advanced materials as applied to the development and design of advanced Navy reentry systems and the life extension of current Navy reentry systems. The Contractor shall also provide similar expert consultation on the development of high temperature composite materials for propulsion applications on tactical missiles. This consultation, review, analysis and training shall include:

- Ensuring that overall approach is feasible: that it meets the program objectives, and that the technical risks are consistent with the program goals.
- Providing training for younger engineers and new hires in K08 pursuing a career in aerothermal analysis. The work shall include defining and coordinating training assignments for young engineers and providing mentoring.
- Preparing presentations and participating in program technical reviews and working group meetings with sponsors, system contractors, and ground test facility.

### Flight Mechanics Support

The contractor shall provide expert consultation, review, analysis and training to support the Reentry Systems Office (K-08) in the areas of Reentry Body Flight Mechanics and Flight testing. This consultation, review, analysis and training shall include:

- Ensuring that overall program approach is feasible: that it meets the program objectives, and that the technical risks are consistent with the program goals.
- Providing training of younger engineers and new hires in K08 pursuing a career in flight mechanics. The work shall include defining and coordinating training assignments for young engineers and providing mentoring.

### **Deliverables:**

Deliverables shall include presentations provided to K08 or presented at program working group meetings or sponsor reviews, as well as training plans for young engineers and new hires in K08 pursuing specific career paths in materials and structures, aerothermal, and flight mechanics subject areas.

**Conditions:**

This TI is not intended to (1) assign work not covered by the scope of the task order; (2) direct a change as defined in the clause entitled "Changes"; (3) increase or decrease the estimated contract cost, the fixed or award fee, the fixed price, the level of effort, or the time required for contract performance; or (4) change any of the terms, conditions, or specifications of the Master Contract and/or Task Order. In the event you consider these requirements to represent a change for which you are entitled to an equitable adjustment, you are to comply with the requirements of the "Changes" clause of the contract and resolution from the Government Contracting Officer must be obtained prior to proceeding with this effort.

**Technical Point of Contact:**

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