



## S<sup>2</sup>MARTS Project Number: 21-01 - Autonomous Flight Safety System (AFSS) for Hypersonic Weapons Systems

### *Request For Solutions (RFS) Questions & Answers | Posted November 17, 2020*

1. **Question:** Will the AFSS be able to access the weapon GPS or IMU, are there provisions to access and compare with independent position information?

**Response:** Yes, data will be made available on a telemetry stream to include GPS, IMU and blended solution.

2. **Question:** Will redundant AFTU's be required?

**Response:** Response Pending

3. **Question:** Will antennas be part of the AFSS response or can the existing antennas on vehicle be used?

**Response:** Existing antennas will be used to transmit a destruct command for situational awareness via telemetry stream.

4. **Question:** Will the weapon flight computer be able to support loss of control reporting?

**Response:** AFSS will need to be able to determine if the flight vehicle is off-course.

5. **Question:** The AFSS will operate from release till near weapon impact, and have the ability to terminate each stage as best determined by the AFTU? Meaning separation and independent stage termination? (I.e. produce a small number of pieces to impact a small footprint).

**Response:** No question posed. AFSS will destruct flight vehicle if premature stage separation occurs.

6. **Question:** This program will focus on the Autonomous Flight Termination Unit, not the weapon termination system or its charges and locations.

**Response:** Correct

7. **Question:** Controlling disposition of hazardous materials (burning propellant, toxic materials, radioactive materials, ordnance, etc.) is intended to suggest the AFSS will be able to predict and plan remaining flight path and thereby terminate in a manner that is safest for the public? The AFSS will consider the likely risks based onboard materials and position.

**Response:** No, risk lines will be pre-determined and documented using instantaneous impact positions.

8. **Question:** Will the program qualify hardware and or test fly hardware within the proposed budget?

**Response:** Yes. The proposers will perform development and support integration within their proposed budget. The government will provide flight vehicles, and range.

9. **Question:** What are the space constraints for the system?

**Response:** Proposer should provide design of their system.

10. **Question:** How many stages are included in the vehicle? Does the AFSS need to be capable of accounting for multiple stages?

**Response:** Yes, the AFSS will need to account for multiple stages.

11. **Question:** With what type of ground equipment will the system need to interface? • What are the maximum predicted environments (MPEs) for each stage the system should be designed to meet?

**Response:** Maximum predicted environments will be provided after agreement award. AFSS will communicate to ground support equipment via Ethernet port.

12. **Question:** Is the AFSS to be qualified (i.e. tested) as part of this effort?

**Response:** Yes

13. **Question:** What types of propulsion are involved and what are the outer mold lines (OMLs) of the stages so that one can develop destruct mechanisms?

**Response:** This information is not required for potential bidders, destruct charges are not part of the proposal.

14. **Question:** Will flight profiles be provided?

**Response:** Representative trajectories will be made available after agreement award.

15. **Question:** What is desired schedule for completion of prototype?

**Response:** The prototype would need to be ready for integration in the Q4 FY22 timeframe.

16. **Question:** Do you require CASS OR2 or OR3?

**Response:** We do not require CASS OR2 or OR3.

17. **Question:** Do you have a target for SWaP?

**Response:** Bidder should provide details for their own design.

18. **Question:** What are key environmental specs: Temp, Vibration, Acceleration, Max Velocity? What are key environmental specs before award?

**Response:** Data will be made available after agreement award.

19. **Question:** Do you want this system to use alternative navigation tool developed in adjacent RFS? Or should we consider COTS GPS assisted IMU or laser ring sensors?

**Response:** Positional data will be provided by on-board vehicle flight computer.

20. **Question:** What is launch configuration and how is internal navigation unit initialized if no GPS?

**Response:** Classified information.

21. **Question:** Is flight qualification of HW / SW required for prototype?

**Response:** Yes

22. **Question:** What destruct methods have been considered?

**Response:** Vehicle destruct charges will be located on each stage and payload.

23. **Question:** What power source is provided? Is a backup battery required? Should the power source be assumed to be provided by the system, and not within the AFSS?

**Response:** 28V conditioned power will be provided.

24. **Question:** What is production date and potential volumes?

**Response:** Information will be provided after agreement award.

25. **Question:** What ranges will be involved in flight approval and testing

**Response:** All national test ranges should be considered

26. **Question:** Do employees working on this project require a security clearance?

**Response:** Yes

27. **Question:** When do you expect contract award?

**Response:** Award varies but is about 70-80 days after close.

28. **Question:** What is your expectation for program duration?

**Response:** this is a three-year effort but can vary based on availability of funds.

29. **Question:** Are there any specific interfaces that we should expect or be aware of?

**Response:** Interface control documents will be made available after agreement award

30. **Question:** Success criteria talks about debris and control of hazardous materials, is the safety analysis for a termination event part of the required scope?

**Response:** No.

31. **Question:** With the reference to hazardous materials, will HAENS level environment testing be required in this scope?

**Response:** No.

32. **Question:** Will the pyrotechnics be provided by the larger program? (i.e. Would we just be sending a signal to activate them...assuming something has gone wrong?)

**Response:** Yes.

33. **Question:** Based on need for flight testing, is there a target goal time window for this testing? Will the testing be on a different boost vehicle than CPS boost vehicle?

**Response:** Testing will be accomplished on sounding rocket vehicles as well as CPS boost vehicle in shadow mode. Flight testing will begin in FY23.

34. **Question:** Does the destruct mechanism need to be part of AFSS design or just the interface to it?

**Response:** Only the interface.

35. **Question:** Is there a target time from PDU to Prototype Qual Unit delivery? To support HWIL and pre-testing prior to integration vehicle.

**Response:** FY22.

36. **Question:** Do you have preferred navigation source for input to AFTU?

**Response:** Input will include GPS and IMU data.

37. **Question:** The RSF discusses both AFSS and AFTU, which are you looking for proposal?

**Response:** Response Pending