Section 1A Technologies for Future Spaceports and Ranges
Autonomous Flight Safety System

Autonomous Flight Safety System (AFSS) is an independent flight safety system designed for small to medium sized expendable launch vehicles launching from or needing range safety protection while overlying relatively remote locations. AFSS replaces the need for a man-in-the-loop to make decisions for flight termination. AFSS could also serve as the prototype for an autonomous manned flight crew escape advisory system.

AFSS utilizes onboard sensors and processors to emulate the human decision-making process using rule-based software logic and can dramatically reduce safety response time during critical launch phases. The Range Safety flight path nominal trajectory, its deviation allowances, limit zones and other flight safety rules are stored in the onboard computers. Position, velocity and attitude data obtained from onboard global positioning system (GPS) and inertial navigation system (INS) sensors are compared with these rules to determine the appropriate action to ensure that people and property are not jeopardized. The final system will be fully redundant and independent with multiple processors, sensors, and deadman switches to prevent inadvertent flight termination.

AFSS is currently in Phase III which includes updated algorithms, integrated GPS/INS sensors, large scale simulation testing and initial aircraft flight testing.

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