



DEPARTMENT OF THE AIR FORCE
UNITED STATES SPACE FORCE
SPACE LAUNCH DELTA 45

27 January 2026

MEMORANDUM FOR LAUNCH SERVICE PROVIDERS (LSP)

FROM: SLD 45/CD-O and SLD 30/CD-O

SUBJECT: Joint Eastern Range (ER)/Western Range (WR) Autonomous Flight Safety System (AFSS) Situational Awareness System (SAS) Display Requirements

References: (a) CSO Memo, 28 Aug 2023, Autonomous Flight Safety System (AFSS) Implementation
(b) SSCI 91-701, 27 December 2022, *Launch and Range Safety Program*

1. As LSPs transition to AFSS to meet the Chief of Space Operations mandate (reference (a)), SSCI 91-701 requires the LSPs to provide an in-flight situational awareness system (SAS) to the USSF Ranges which provides near real-time launch vehicle information for situational awareness, operational reporting, and emergency response throughout the flight period of Range Safety responsibility. To ensure Range Operators receive the necessary data, LSPs will provide an option for the Ranges to receive data. For missions at the Eastern Range, data will be provided at the Morrell Operations Center. For missions at the Western Range, data will be provided at either the Western Range Operations Control Center or another coordinated and approved location.
2. The attached Joint ER/WR AFSS SAS Display Requirements provides an in-depth list of required data needed to provide the necessary flight safety oversight and reporting. The requirements for the AFSS SAS Display are derived from SSCI 91-701, paragraph 6.1. Flight Safety System (FSS) Composition and paragraph 6.10. Autonomous Flight Safety System (AFSS) Ground Element Requirements.
3. Range Operators will coordinate with the LSP to determine the best method of delivery of the required data for the AFSS SAS Display. AFSS SAS Displays require approval from SLD 30/SE for missions from the Western Range and from SLD 45/SE and 1 ROPS for missions from the Eastern Range. The AFSS SAS Displays will be available and tested no later than 30 days prior to the first AFSS launch to ensure proper operations.
4. If there are any questions, please feel free to contact the POCs for this matter, either Mr. Todd Smith at todd.smith.2@spaceforce.mil or (321) 853-8541 at the Eastern Range; or Ms. Sarah Nemeth at sarah.nemeth.5@spaceforce.mil or (805) 606-5626 at the Western Range.

JOYCE A. BULSON, Colonel, USSF
Deputy Commander

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Attachment:

1. ER/WR Range Operations AFSS Situational Awareness System Display Requirements

cc:

SLD 45/SE

SLD 30/SE

ER/WR Range Operations
AFSS Situational Awareness System Display Requirements
Attachment 1

1. A two-dimensional display with a map of the earth overlaid with the following:
 - a. Nominal trajectory with nominal energy tick marks on it for staging and separation events and a moving indicator (ex: a box) to display the expected/nominal Instantaneous Impact Point (IIP) location at any time on the nominal trajectory from T-0 to AFSS Safed.
 - b. Left and right dispersed trajectories or the 3 Sigma left and right trajectories
 - c. Impact Limit Lines and Destruct Lines
 - d. Instantaneous Impact Point, Present Position Point, and associated history traces
 - e. Perigee Check Gate (Definition: Perigee Check Gate rule will prevent an extremely low-performing vehicle (one that is incapable of making a safe parking orbit of 70 nautical miles perigee) from crossing the Perigee Check Gate. Any vehicle with a perigee lower than the perigee check when the IIP crosses the perigee check gate, will be terminated. Any vehicle with a perigee greater than or equal to the perigee check when the IIP crosses the Perigee Check Gate will be allowed to continue flight.)
 - f. Safing Gate (Definition: The Safing Gate defines a distance downrange of the launch pad at which the FSS is no longer required to adequately protect public safety. The FSS will safe when the IIP is downrange of the Safing Gate)
 - g. Plus-count time (T+) in minutes and seconds
 - h. Mission label with the applicable mission name

Note: This display must be selectable to allow the operator to 1) manually zoom in and out as well as slew/scroll the map up and down and side to side to view the progress of vehicle flight and 2) select an auto-scroll capability which keeps the IIP centered on the screen as it scrolls the background map behind the IIP as it progresses through flight. If multiple stages will be active / in-flight at the same time, then the display must have the capability to have multiple windows selectable / open to monitor the different stages.

2. A display page or overlay for the map display which displays overhead and side profiles of the vehicle's present position, associated history trace in relation to the nominal trajectory, and a moving indicator (ex: a box) to display the expected/nominal present position location at any time on the nominal trajectory from T-0 to AFSS Safed.
3. A side panel on the map display (preferable) or a display page/overlay which displays vehicle and AFSS status to include:
 - a. Liftoff Detect Indicator
 - b. Vehicle event discrete indicators (ex: Solid motor burnout, solid motor separation 1st Stage Burnout, Stage 1 separation, Stage 2 ignition, payload fairing separation, Stage 2 shutdown)
 - c. Vehicle Altitude
 - d. Engine / Solid Motor Chamber Pressures
 - e. Steering & Attitude data (Pitch, Yaw, and Roll rates)

- f. Health & Status of each AFSS string to include the number of valid/functioning AFSS navigation sensors on each AFTU/AFSS string
 - g. Armed/Safed discrete indicators for each AFTU/AFSS string
 - h. Discrete indicators for when Destruct commands are sent by each AFTU/AFSS string
4. A continuously updated Vehicle Data Page or overlay on the map display with the following information for each navigation sensor (ex: GPS and TMIG) on each AFSS String:
- a. Predicted Impact Point Location Latitude in DD:MM:SS
 - b. Predicted Impact Point Location Longitude in DD:MM:SS
 - c. Range from the Pad in NMi
 - d. Present Position Location Latitude in DD:MM:SS
 - e. Present Position Location Longitude in DD:MM:SS
 - f. Azimuth/Heading in degrees (DDD)
 - g. Apogee in NMi
 - h. Perigee in NMi
 - i. State Vector at Destruct (if occurred; EFG position in meters and velocity vectors in meters/sec)
 - j. Confirmed Destruct Time in HH:MM:SS in UTC (if occurred)
 - k. GPS Time in seconds at Destruct (if occurred)
 - l. T+ Plus Time at Destruct (if occurred)
 - m. Mission Elapsed Time in HH:MM:SS at Destruct (if occurred)
 - n. An indication that shows information received is continuously updated (for example, telemetry frame sync status)

Note: At a minimum, the display must provide all of the above data through AFSS safing. In addition, perigee data must be provided through orbital insertion defined as +70 NMi perigee. In the event the AFSS initiates vehicle destruct, the data page must retain/continue to display the last reported data at the time that destruct occurred.