

**MEMORANDUM OF AGREEMENT
BETWEEN
DEPARTMENT OF THE AIR FORCE
AND
FEDERAL AVIATION ADMINISTRATION
ON SAFETY
FOR
SPACE TRANSPORTATION
AND
RANGE ACTIVITIES**



U.S. AIR FORCE



I. PURPOSE

This Memorandum of Agreement (Agreement) explains the roles and responsibilities of the Department of the Air Force (AF) and Federal Aviation Administration (FAA) for overseeing safety of commercial space launch and reentry.

II. SCOPE

This Agreement applies to launch (including launch processing at a launch site in the United States) and reentry, carried out within the United States or by a United States citizen, as overseen, licensed and regulated by the Federal Aviation Administration's Associate Administrator for Commercial Space Transportation, through delegation of authority from the Secretary of Transportation and pursuant to 49 United States Code (U.S.C.) Subtitle IX -- Commercial Space Transportation, Ch. 701, Commercial Space Launch Activities, 49 U.S.C. 70101-70121 (Chapter 701). This Agreement does not alter or otherwise modify the roles and responsibilities delineated by statute or national policy for the AF or FAA.

III. AUTHORITY

A. The Department of Transportation is authorized to enter this agreement in the exercise of its responsibility to license and regulate commercial space transportation activities established by Chapter 701. The Office of the Associate Administrator for Commercial Space Transportation (AST) within the FAA acts on behalf of the Secretary of Transportation in carrying out the Department's statutory responsibilities regarding commercial launch and reentry.

B. The Air Force is authorized to enter this agreement in the exercise of its responsibility to conduct the affairs of the Department of the Air Force as specified in 10 U.S.C. Chapter 803. In addition, as the owner and operator of the two primary space launch bases and ranges at Cape Canaveral Air Force Station, Florida, and Vandenberg Air Force Base, California, the AF has the responsibility for ensuring that activities at those facilities do not unreasonably endanger public health and safety, and safety of property.

C. In accordance with Federal Acquisition Regulation 17.500(b), the

Economy Act, 31 USC Section 1535, provides authority for intra-agency transactions of supplies or services when more specific statutory authority does not exist.

D. 14 Code of Federal Regulations (C.F.R.) Ch. III, part 417 (Part 417)¹ and the range safety requirements of Eastern and Western Range Requirement (EWR) 127-1 or equivalent contain specific guidance applicable to all FAA-licensed launches from AF launch ranges.

IV. OBJECTIVES

The Parties' objectives entering into this Agreement are to:

A. Continue current cooperation between the AF and FAA regarding licensed launch and reentry activities;

B. Minimize the regulatory burden on the U.S. commercial space sector by clearly delineating federal agency requirements and oversight responsibilities, thereby precluding unnecessary overlap and duplication; and

C. Provide an agreed to and stable framework for the U.S. space launch industry.

V. DEFINITIONS

This Agreement contains terms defined in Chapter 701, Section 70102. The terms include launch, launch vehicle, launch site, person, reentry, reentry vehicle, and reentry site. Additional terms used in this Agreement are defined as follows:

A. Federal launch range: a launch site owned and operated by the government of the United States from which launches routinely take place or where government facilities, services, and organizations routinely support launches originating from within the operational boundaries thereof. These include federally owned and operated sensor and command and control capabilities necessary to safely conduct space launch and reentry operations and to test and evaluate ballistic missiles and other systems. AF space launch ranges are federal launch ranges and consist of the Eastern

¹ Detailed requirements in part 417 are contained in a notice of proposed rulemaking. 65 Fed. Reg. 63921 (Oct. 25, 2000). Although not effective yet, that proposed version of part 417 describes the FAA's current practice.

Range, headquartered at Patrick Air Force Base and primarily located at Cape Canaveral Air Force Station, and the Western Range, headquartered at Vandenberg Air Force Base.

B. Non-federal launch site: a launch site located outside of any federal launch range, the operation of which is licensed by the FAA.

C. Licensed launch operator: any person licensed to conduct a launch under Chapter 701. When the AF carries out a launch for the AF or the U.S. Government, the AF is not a “licensed launch operator” and does not require a license.

D. Licensed launch: a launch conducted by a U.S. citizen or within the U.S. which is authorized by the FAA in accordance with Chapter 701.

E. Government launch: a launch the Government carries out for the Government. In accordance with Chapter 701, Section 70117(g), a Government launch is not licensed by the FAA.

VI. COMMON SAFETY REQUIREMENTS FOR LAUNCH

The AF and the FAA will work together to achieve common safety requirements for launches. These requirements will be codified in the Code of Federal Regulations (14 C.F.R. Ch. III, Part 417) through FAA rulemaking. AF implementation of the common safety requirements as they apply to launches from AF launch ranges and any AF unique requirements will be reflected in Eastern and Western Range Requirements (EWR) 127-1 or equivalent. The AF and FAA will coordinate activities to ensure compliance with the common safety requirements for all FAA-licensed launches from AF launch ranges.

A. The FAA will rely on AF safety processes for the review of all licensed launches from AF launch ranges for compliance with the common safety requirements, provided that the FAA’s baseline assessments of the AF launch ranges (developed according to section VII[A]) find that the AF safety processes, procedures, and requirements implemented for each licensed launch satisfy Part 417.

B. The AF will accept any FAA determinations made under paragraph (A) with regard to licensed launch operator compliance with Part 417 requirements, and the FAA will accept any AF determinations made regarding launch operator compliance with

EWR 127-1 or equivalent, consistent with section VI(D) and (E).

C. The AF and the FAA will develop, maintain, and implement a process for communication with respect to interpretations of safety requirements common to EWR 127-1 and Part 417 as they apply to Government and FAA-licensed launches respectively. This process will be implemented for the following as they apply to Government and FAA-licensed launches:

- i. New launch vehicle systems;
- ii. New configurations of existing launch vehicle systems; and
- iii. Requests from any launch operator for a waiver, deviation or meets intent certification. Such requests shall result in notification of the other agency. The other agency may request additional information as it deems necessary.

D. For a licensed launch from an AF launch range, the FAA recognizes that it does not have the authority to waive or grant deviations to any AF launch range requirements contained in EWR 127-1 or equivalent. Further, for a non-licensed launch from an AF launch range, the FAA recognizes that it has no authority over the requirements contained in EWR 127-1 or equivalent, regardless of the source.

E. For a licensed launch, the AF recognizes that it does not have the authority to waive or grant deviations to a Part 417 safety requirement whether or not that requirement is contained in EWR 127-1 or equivalent. Further, for a licensed launch, the AF recognizes that it has no authority over the requirements contained in Part 417, regardless of the source. If a licensed launch operator requests a waiver, deviation, or meets intent certification from the AF for a Part 417 requirement, the AF will notify the commercial launch operator that it must apply to the FAA for an appropriate determination under its FAA license. The AF will also notify the FAA of the request. The AF and the FAA will coordinate to resolve any known waiver, deviation, or meets intent issues related to the common safety requirements prior to the Launch Readiness Review (LRR).

F. The AF and the FAA will share, to the greatest extent possible, launch vehicle safety and performance data common across licensed and non-licensed launches for the purposes of maintaining an accurate baseline concerning common systems' safety and performance.

VII. RANGE OPERATIONS

A. FAA Baseline Assessments of AF Launch Ranges. The FAA's Baseline Assessment of each AF launch range, as outlined in Annex A and available through the FAA space transportation web site, provides a basis for the FAA's reliance on the adequacy of the safety related launch property and services provided by the AF to licensed launch operators. These Baseline Assessments are essential to the FAA's fulfillment of its regulatory responsibilities in regard to licensing commercial launch operations from AF launch ranges. To ensure that each Baseline Assessment accurately reflects the situation and conditions under which proposed operations would take place at an AF launch range, the AF and FAA agree to the following:

i. The AF will notify the FAA in advance of changes or modifications proposed to any of the areas of a Baseline Assessment outlined in Annex A. This notification is for the purpose of updating areas of the Baseline Assessment as identified in Annex A. FAA concurrence is not required as a condition to proceed with baseline changes.

ii. The FAA will notify the AF in advance of changes or modifications proposed to either the scope or content of a Baseline Assessment.

iii. Specific mechanisms will be developed and maintained to ensure that the FAA and the AF are informed in advance of such changes and to permit the AF to review the Baseline Assessment of an AF launch range for accuracy.

iv. The FAA will work with the AF as appropriate to address issues raised on a case-by-case basis with any licensed launch operator regarding safety issues at an AF launch range

B. Licensed Launch Go/No-Go. The FAA has the responsibility and authority to oversee the conduct of all licensed launches and may prohibit, suspend, or end immediately a licensed launch prior to flight if at any time the FAA determines such launch is detrimental to public health and safety, safety of property, or any national security or foreign policy interest of the United States. The AF has responsibility for

public health and safety, property (either public or private) and any national security interest of the United States and will exercise its authority to prohibit, hold, or end a launch if safety or other requirements are not fully satisfied. For commercial activities on AF-managed federal launch ranges, each party fully recognizes the authority of the other and neither party will allow operations to continue over any objections of the other.

i. For FAA-licensed launches from an AF launch range, the AF and the FAA will coordinate and support their respective activities to ensure that applicable requirements of both agencies are satisfied for each launch.

ii. At AF launch ranges, the AF will provide that support it agrees is necessary to facilitate this coordination and for the FAA to carry out its responsibilities during readiness reviews and the launch-count. The FAA and the AF agree that this support is a launch service under Chapter 701. Support of the FAA under this paragraph will not result in a net cost to the AF.

iii. The AF and the FAA will jointly develop and implement subordinate agreements to fulfill the goals of paragraph VII(B) at AF launch ranges. The agreements will incorporate the following elements:

a) Provisions for appropriate FAA and AF representatives to remain in communication to ensure that both agencies are informed of all issues arising prior to the final Launch Readiness Review (LRR) that could affect their respective roles and responsibilities; and

b) Provisions to promote the full integration of the FAA into the LRR and the launch count process for all licensed launches. This includes providing the FAA personnel the necessary on-console communications capability to keep apprised of countdown status with two-way connectivity to the Launch Decision Authority (LDA) and commercial launch Mission Director (MD) to ensure clear lines of communication between agency representatives during the launch-count. In the event that the FAA makes a determination to prohibit, suspend, or end immediately a licensed launch prior to launch, the FAA will, time permitting, notify the MD that the launch is no longer authorized. If time does not permit, the FAA will call a hold in accordance with

established range procedures. The agreement will further identify the communications equipment and protocols to be used. The AF and the FAA acknowledge their responsibility to provide on-console personnel that are appropriately trained to perform their associated duties. The FAA and the AF agree that this support is a launch service under Chapter 701. Support of the FAA under this paragraph will not result in a net cost to the AF.

VIII. NATIONAL AIR/SPACE MANAGEMENT

A. Collision Avoidance (COLAs). For the purposes of this MOA, COLA is defined as that analysis which is run against habitable orbiting objects to ensure their orbits do not conflict with the intended flight path of a launch or reentry vehicle in time and place.

i. The FAA will, upon issuance of a launch license, inform HQ Air Force Space Command (AFSPC) that a licensed launch operator is eligible for COLA analyses.

ii. The AF and FAA will work together to formulate appropriate subordinate implementation agreements concerning processes, procedures, and points of contact for collision avoidance for FAA licensed reentry activities.

iii. The AF will work with U.S. Space Command (USSPACECOM) to assure COLA analysis is performed for all habitable orbiting objects prior to each licensed launch or reentry. For habitable orbiting objects, all launch-holds resulting from the COLA analysis are mandatory.

iv. The AF and FAA concur that providing a COLA required by the FAA for a commercial launch license is a launch service under Chapter 701, and, in accordance with Chapter 701, the AF will charge licensed launch operators for that service.

B. Altitude Reservations (ALTRVs).

i. The AF will be responsible for preparing a request for moving or

stationary ALTRVs for all launches and reentries at AF launch ranges. The AF will forward the ALTRV request to the FAA's Air Traffic Control System Command Center (ATCSCC) Central Altitude Reservation Function (CARF). The AF will format the request in accordance with FAA Order 7610.4, Special Military Operations.

ii. The FAA will utilize existing processes and guidelines for ALTRVS for commercial launch and reentry activities at non-federal launch sites.

iii. For licensed launches from non-federal launch sites, the FAA will resolve airspace clearance issues. For launches from federal launch ranges, the FAA and AF will develop procedures for resolving issues that arise in both national and international airspace.

IX. SPACE TRANSPORTATION AND RANGE PARTNERSHIP

In accordance with their respective obligations, the FAA and the AF will cooperate to solidify and expand their partnership for the safety of all U.S. launches.

A. Roles and Responsibilities Regarding Licensing Process.

The FAA has authority to issue a license to a U.S. citizen conducting a launch in the U.S. or a foreign territory, to anyone launching from U.S. territory and to a foreign entity controlled by a U.S. citizen launching outside the territory of any nation. The FAA exercises this responsibility consistent with public health and safety, safety of property, and the national security and foreign policy interests of the United States. In determining whether to issue a license, the FAA conducts a process that includes pre-application consultations with the prospective applicant, an interagency policy review, a safety review and approval, a payload review and determination, a maximum probable loss determination that is used to set financial responsibility requirements, and an environmental review. Once the FAA receives and accepts a license application that it deems sufficiently complete to commence review, the FAA is required by statute to make a license determination within 180 days in accordance with 14 C.F.R. 413.15(b).

i. In order to expedite the FAA licensing process and ensure public safety, the FAA and the AF agree to exchange information and data as needed regarding

proposed FAA licensed launches, including, but not necessarily limited to, Maximum Probable Loss (MPL) data, MPL analyses, safety waiver requests and approvals, and changes affecting Baseline Assessments.

ii. For a licensed launch from an AF launch range, the FAA and the AF will:

a. Recognize that EWR 127-1 or equivalent applies to all launches from AF launch ranges and, additionally, that Part 417 requirements apply to all FAA licensed launches;

b. Share information regarding proposed launches;

c. Document each issue related to public safety and its resolution for a proposed launch, and make available all findings to each other upon request; and

d. Notify each other of any specific change to the proposed launch that may alter or change any previously conducted analysis or conclusion.

iii. For a licensed launch from a non-federal launch site the FAA will:

a. Initiate and request coordination with the AF when the FAA requires AF expertise in resolving any outstanding safety issue that requires resolution prior to issuance of a launch license;

b. Provide to the AF any information, data, or results of analyses that may assist the AF to produce analyses, or other information the AF has agreed to provide the FAA in support of the FAA licensing process; and

c. Share safety related information regarding any proposed launch that may impact any AF operation or mission.

iv. For a licensed launch from a non-federal launch site the AF will:

a. Per request and as resources are available, assist the FAA in its analysis of the safety of the proposed launch; and

b. Support the FAA's licensing decisions, including initial license determinations and license modifications through sharing of models, data, or other information as requested and available.

B. Exchange and Sharing of Safety and Engineering Resources. The FAA and the Air Force will, per request and as resources are available, jointly make available opportunities to exchange FAA and AF personnel (e.g., from the AF launch ranges and from FAA/AST) to:

- i. Coordinate safety oversight for commercial launches occurring from non-federal launch sites;
- ii. Coordinate safety oversight for commercial launches occurring from AF launch ranges; and
- iii. Inspect/evaluate flight safety systems and conduct flight safety analyses for licensed launches from AF launch ranges and non-federal launch sites.

C. Cross-Training of Personnel.

- i. The FAA will create and make available to the AF opportunities to train AF personnel on FAA regulatory processes.
- ii. The FAA will participate in training exercises made available by the AF for range safety and operations.
- iii. The AF will create and make available to the FAA opportunities to train FAA/AST personnel on AF range safety and operational processes for launches occurring from the AF launch ranges.
- iv. The AF will participate in training exercises made available by the FAA regarding FAA regulatory processes.

X. REIMBURSEMENT

The AF and FAA will formulate appropriate subordinate agreements as necessary to reimburse each other to carry out this MOA. These subordinate agreements will be consistent with the standard method of reimbursement for AF and FAA-provided services and products rendered. The AF and the FAA will formulate appropriate subordinate agreements for the FAA to reimburse the AF for support rendered to the FAA by the AF for licensed launches taking place at non-federal launch sites.

XI. MISHAP INVESTIGATION

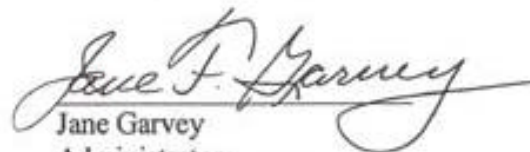
The FAA and AF agree to cooperate and exchange information on mishaps of mutual interest. Details are to be included in a separate MOA.

XII. IMPLEMENTATION

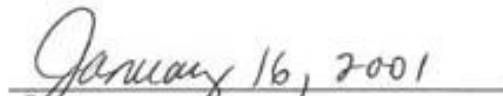
The AF and FAA should use this Agreement as a basis for writing implementing procedures to carry out their respective responsibilities for commercial space transportation and range activities. With regard to this MOA, the primary point of contact for the FAA within the AF shall be the Assistant Secretary of the Air Force for Space and the primary point of contact for the AF within the FAA shall be the Associate Administrator for Commercial Space Transportation. The Assistant Secretary and Associate Administrator shall be mutually responsible for the successful execution of this MOA. This agreement will be reviewed every four years to determine the need for any modifications. Either the FAA or the AF can request modifications at any time.



Keith R. Hall
Assistant Secretary of the Air Force (Space)



Jane Garvey
Administrator
Federal Aviation Administration



Date

ANNEX A: FAA Baseline Assessment.

Section 415.31 of 14 CFR directs the FAA to issue a license to an applicant proposing to launch from a federal launch range if the applicant satisfies the requirements of subpart C of the licensing regulations and has contracted with the federal launch range for the provision of launch services and property, as long as the safety related launch services and proposed use of property are within the experience of the federal launch range. All other safety services and property associated with an applicant's proposal are evaluated on a case-by-case basis.

The FAA does not duplicate analyses performed by the federal launch ranges or routinely review those analyses during the launch safety review. Instead, the FAA relies on its knowledge of the range processes as documented in the FAA's Baseline Assessments. A federal launch range, however, may not adequately address some regulatory safety issues. The failure of federal launch range safety systems or procedures may, for example, affect the FAA's ability to rely on those aspects of federal launch range services. The FAA may ascertain this during the course of a pre-application consultation or once an applicant submits its application, or through its communications regarding launch activities with the federal ranges. The FAA may then require the applicant to demonstrate safety with respect to those specific areas of concern on a case-by-case basis. In addition to requiring a showing of safety from the applicant, the FAA will also work with the federal launch range to address the issue, and will update the FAA's Baseline Assessment as appropriate.

FAA's Baseline Assessment documents each federal launch range's capabilities, safety program, standards and policies. This Baseline Assessment includes, but is not limited to the following and related areas:

- General information including:
 - Local-area and population information
 - Range organizational structure
 - Range history and general capabilities
 - Range commercial programs
 - Introduction process for new customers and contracting requirements

- Facility site and lease and license processes
 - Environmental documentation
- Launch Base and Range description including:
 - Complexes, facilities and equipment (on and off the range)
 - Vehicle support capabilities
- Safety organization and responsibilities
- Safety policy including:
 - Public exposure
 - Control systems
 - Clearance zones
 - Safety approvals
- Safety Program including:
 - Launch vehicle ground system safety and policies
 - Flight safety approval process, safety analyses, systems, procedures and criteria
 - Non-Compliance policies and procedures
 - Safety reviews
 - Safety operations responsibilities, standards and procedures
- Personnel Training and Certifications
 - Mission Flight Control Officers
 - Flight safety analysis
 - Vehicle system safety
 - Personnel performing other safety related functions
- Range Interfaces (Operations, Logistics, Medical, etc.)
- Range User Responsibilities
- Safety Related Computer Software