

**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 processing, launch, 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 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 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 providing for resource protection.

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, and the range safety requirements of AFSPCMANs 91-710 and 91-711 or equivalent contain specific requirements applicable to all FAA-licensed launches from Air Force Space Command 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, oversight responsibilities and consolidating AF and FAA documentation products where possible, 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 USC Title 49, Chapter 701, Sections 70102 and 70111. The terms include launch, launch vehicle, launch site, person, reentry, reentry vehicle, reentry site, U. S. Citizen, and direct cost. Additional terms used within the context of this agreement are defined as:

A. Experimental permit: An authorization by the FAA to launch or reenter a reusable suborbital rocket for testing and development (14 C.F.R. Ch. III, Subchapter C, Part 437).

B. FAA safety approval: an FAA determination that one or more of the safety elements, when used or employed within a defined envelope, parameter, or situation, will not jeopardize public health and safety of property. An FAA safety approval may be issued for the following elements: launch vehicle, reentry vehicle, safety system, process, service, or any identified component thereof, or qualified and trained personnel performing a process or function related to licensed launch activities (14 C.F.R. Ch. III, Subchapter C, Part 414, Section 414.3).

C. 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. Air Force Space Command launch ranges are federal launch ranges and consist of the Eastern Range, headquartered at Patrick Air Force Base, FL and primarily located at Cape Canaveral Air Force Station, and the Western Range, headquartered at Vandenberg Air Force Base, CA.

D. Government launch: a launch that the Federal Government carries out for Federal Government purposes. In accordance with USC Title 49, Chapter 701, Section 70117(g), a Government launch is not required to be licensed by the FAA.

E. Launch Site Safety Assessment (LSSA): An FAA assessment of a Federal launch range to determine if the range meets FAA safety requirements. A difference between range practice and FAA requirements is documented in the LSSA.

F. Licensed launch operator: any person licensed to conduct a launch under USC Title 49, Chapter 701. When the AF carries out a launch for the AF or the U.S. Government, whether directly or through a contractor, the AF and any contractor is not operating as a "licensed launch operator" and does not require a license.

G. Licensed launch: a launch conducted by a U.S. citizen or within the U.S. which is authorized by the FAA in accordance with USC Title 49, Chapter 701.

H. Manned object: Spacecraft that are currently occupied or are expected to be occupied in the future. Examples are the International Space Station, the Space Transportation System, and Progress supply vehicles to manned objects.

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

VI. COMMON SAFETY REQUIREMENTS FOR LAUNCH

The AF and the FAA will continue to work together to develop, maintain, and improve common safety requirements for launches. These requirements are 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, are reflected in applicable Air Force Instructions and Air Force Space Command Manuals (AFSPCMANs) 91-710 and 91-711. 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 launch site safety assessments (reference 14 C.F.R. Ch III Subchapter C, Part 415, Section 415.31) 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 14 C.F.R. Ch III, Subchapter C, 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 applicable Air Force Instructions and AFSPCMANs 91-710 and 91-711 or equivalent, consistent with section VI(D) and (E).

C. The AF and the FAA will continue to jointly develop, maintain, and implement a process for communication with respect to interpretations of safety requirements common to applicable Air Force Instructions and AFSPCMANs 91-710 and

91-711 and 14 C.F.R. Ch III, Subchapter C, 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;

D. The AF and FAA will work together to resolve requests from a launch operator for relief from a common safety requirement. This process will be handled in accordance with the Memorandum of Understanding between Air Force Space Command and the Federal Aviation Administration Office of the Associate Administrator for Commercial Space Transportation for Resolving Requests for Relief from Common Launch Safety Requirements, dated 15 August 2005.

E. For a licensed launch from an AF launch range, the FAA recognizes that it does not have the authority to grant relief from any AF launch range requirements contained in applicable Air Force Instructions and AFSPCMANs 91-710 and 91-711 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 applicable Air Force Instructions and AFSPCMANs 91-710 and 91-711 or equivalent.

F. For a licensed launch, if a licensed launch operator requests relief from the AF for a 14 C.F.R. Ch III, Subchapter C, Part 417 requirement, the AF will notify the commercial launch operator that it does not have authority to grant this request, and the operator 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 jointly resolve any requests for relief related to the common safety requirements prior to the Launch Readiness Review (LRR).

G. 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.

H. Where appropriate, and with regard to its review of applications for FAA

Safety Approvals (14 C.F.R. Ch III, Subchapter C, Part 414), the FAA will consult with the AF and other government agencies involved with the operation of federal launch ranges to minimize the possibility of a discrepancy between the FAA's evaluation and any later evaluation by another federal agency.

VII. RANGE OPERATIONS

A. FAA LSSAs of AF Launch Ranges. The FAA's LSSA 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 LSSAs 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 LSSA 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. As soon as practicable, the AF will notify the FAA in advance of changes or modifications proposed to any of the areas covered by the LSSA outlined in Annex A. This notification is for the purpose of updating the LSSA. FAA concurrence is not required as a condition to proceed with the Air Force-proposed modifications.

ii. As soon as practicable, the FAA will notify the AF in advance of changes or modifications proposed to either the scope or content of an LSSA.

iii. The AF and FAA will continue to closely cooperate to ensure that both the AF and FAA are informed in advance of such changes and to permit the AF to review the LSSA 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 or permitted launches and may prohibit,

suspend, or immediately end 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 safety, launch base personnel safety, government resources, and any national security interest of the United States. The AF 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, both the AF and FAA fully recognize 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 USC Title 49, Chapter 701. Support of the FAA under this paragraph will not result in an increase in direct cost to the AF.

iii. The AF and the FAA will continue to jointly develop and implement subordinate formal agreements and other understandings 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 immediately end a licensed 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 USC Title 49, Chapter 701. Support of the FAA under this paragraph will not result in an increase in direct cost to the AF.

VIII. NATIONAL AIR/SPACE MANAGEMENT

A. The Air Force and FAA shall, at a minimum, take the following actions to ensure the intended flight path of a licensed launch or reentry vehicle does not conflict with the intended flight path of another launch or reentry vehicle in time and place.

i. The FAA will, upon issuance of a launch license or experimental permit with a planned altitude to exceed 150 kilometers, inform the AF that a licensed launch operator is eligible for collision avoidance (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 ensure that COLA analysis is performed, at a minimum, for all orbiting manned objects prior to each licensed launch or reentry. For manned 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 or permit is a launch service under USC Title 49, Chapter 701, and, in accordance with USC Title 49, Chapter 701, the AF will charge licensed launch operators for that service. Alternative authority for DoD to provide such

analyses exists pursuant to 10 USC 2274 and related OSD delegations as well as the Space Act of 1958 as amended.

B. Airspace Clearance

i. The AF will be responsible for preparing a request for moving or stationary Altitude Reservations (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 Operations, or applicable regulatory requirements.

ii. The FAA will utilize existing processes and guidelines for ALTRVs and Temporary Flight Restrictions 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.

C. Launch and Reentry Notification. The FAA will inform the Air Force of a pending FAA/AST-authorized launch or reentry. The FAA will also provide information to the Air Force on other launches, as appropriate.

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 (MPL) 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(a).

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, MPL data, MPL analyses, safety waiver requests and approvals, and changes affecting LSSAs.

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

a. Recognize that applicable Air Force Instructions, including AFSPCMANs 91-710 and 91-711, or equivalent apply to all launches from AF launch ranges and, additionally, that Part 417 requirements apply to all FAA-licensed Expendable Launch Vehicle launches and Part 431 requirements apply to all FAA-licensed Reusable Launch Vehicle launches;

b. Share information regarding proposed launches;

c. Document each public safety-related issue 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 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. Roles and Responsibilities Regarding New Activities. The AF and FAA will closely cooperate with each other to fulfill their safety oversight roles pertaining to new activities occurring from federal launch ranges, such as Experimental Permits, Reusable Launch Vehicles, and Human Space Flight. Under the authority given by USC Title 49, Ch. 701, the FAA issues regulatory requirements for Experimental Permits, Reusable Launch Vehicles as Part 431, and Human Space Flight as Part 460.

C. 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.

D. Cross-Training of Personnel.

i. The FAA will create and make opportunities available to the AF 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 opportunities available to the FAA 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.

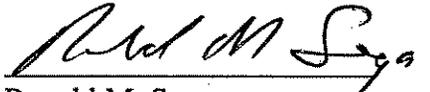
XI. MISHAP INVESTIGATION

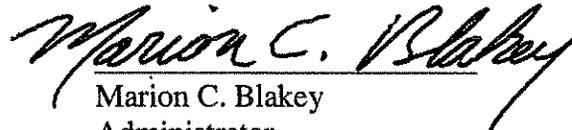
The FAA and AF agree to cooperate and exchange information on mishaps of mutual interest in accordance with the Memorandum of Understanding between the National Transportation Safety Board, the Department of the Air Force, and the Federal Aviation Administration Regarding Space Launch Accidents dated 7 Sep 04.

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. The primary point of contact for the AF shall be the Under Secretary of the Air Force and the primary point of contact for the FAA shall be

the Associate Administrator for Commercial Space Transportation, who together shall be mutually responsible for the successful execution of this agreement. This agreement will be reviewed every five years to determine the need for any modifications. Either the FAA or the AF can request modifications at any time.


Ronald M. Sega
Under Secretary of the Air Force


Marion C. Blakey
Administrator
Federal Aviation Administration

7/31/07
Date

SEP 13 2007
Date

ANNEX A: FAA Launch Site Safety Assessment.

Section 415.31 of 14 CFR (Title 14 of the Code of Federal Regulations) directs the FAA to issue a safety approval to a license applicant proposing to launch from a federal launch range if the applicant satisfies the requirements of subpart C and has contracted with the federal launch range for the provision of safety-related launch services and property, as long as the FAA assessment shows that the range's launch services and launch property satisfy part 417 of the chapter. The FAA evaluates on an individual basis all other safety-related launch services and property associated with an applicant's proposal in accordance with part 417.

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 LSSAs.

An LSSA is unique for each government range. The LSSA is not directive in nature, but serves only as a comparison between the requirements in 14 CFR part 417 and the current practice employed at the respective federal launch range. The main purpose of the LSSA is to provide a reference for the FAA to use in its launch license approval process. The LSSA describes how the safety policies and practices used at a particular range compare to FAA regulations. In essence, LSSAs are the FAA's mechanism for assessing the capabilities of respective range safety organizations to protect public health and safety, when a range provides services to commercial launch companies. This establishes a safety baseline used to help AST determine, through the licensing process, whether a commercial launch proposal adequately protects public health and safety and safety of property.

A federal launch range may not adequately address some FAA regulatory safety issues. Such differences 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 to satisfy FAA requirements for a launch operator. 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. The FAA will also work with the

federal launch range to address the issue, and will update the FAA's LSSA as appropriate.