

31 OCTOBER 2001



Operations

SPACE LAUNCH OPERATIONS

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Pages: 9  
Distribution: F

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This instruction implements AFD 10-12, *Space*. It establishes the space launch responsibilities and authorities of Air Force Space Command (AFSPC) and Air Force Materiel Command (AFMC). This instruction applies to all missions involving USAF-acquired operational, research and development and test launch vehicles, to include Minotaur, Pegasus, Taurus, Atlas II/III, Delta II/III, Titan II and Titan IV, but excluding Atlas V and Delta IV. This instruction applies to all activities from the decision to ship to the launch base to the conclusion of launch operations. Maintain and dispose of records created as a result of prescribed processes in accordance with AFMAN 37-139, *Records Disposition Schedule*. Refer recommended changes and conflicts between this and other publications, using Air Force (AF) Form 847, **Recommendation for Change of Publication**, through channels to AF/XOOT, 1480 Air Force Pentagon, Washington, DC 20330-1480.

**1. Launch Roles.** AFMC acquires and sustains, and AFSPC operates and maintains, USAF space launch systems in accordance with AFMD 4 and AFMD 5. Throughout the program lifetime, AFMC and AFSPC will apply the best engineering and operations talent regardless of MAJCOM affiliation and sustain strong inter-command teamwork and engineering and operations discipline. For all USAF missions, AFMC is the supported command and AFSPC is the supporting command for launch base processing activities through the Space and Missile Systems Center (SMC) Commander's Flight Readiness Review (FRR) and space flight worthiness certification. For all USAF missions, AFSPC is the supported command and AFMC is the supporting command for all activities, including launch operations and establishing flight readiness of the integrated stack, following the FRR and space flight worthiness certification. For all USAF-acquired launch vehicles and USAF-acquired spacecraft, AFMC retains flight worthiness responsibility and Operational Safety, Suitability, and Effectiveness responsibility throughout the system lifecycle. AFSPC will support AFMC in developing and preserving the Operational Safety, Suitability, and Effectiveness baseline for USAF-acquired launch vehicles and USAF-acquired spacecraft. For

non-USAF missions, AFSPC and AFMC will provide the payload owner with launch vehicle processing, launch operations and launch vehicle certification in accordance with 63-series policies and procedures.

## 2. Responsibilities and Authorities.

### 2.1. Mission Director

2.1.1. The head of AFMC's Space and Missile Product Line (for USAF missions) or the spacecraft owner (for non-USAF missions) will appoint a Mission Director.

2.1.2. The Mission Director (or designee):

2.1.2.1. Will be responsible for spacecraft and launch vehicle processing and maintaining flight worthiness for the elements of the integrated stack. The Mission Director will accomplish this through the launch vehicle Single Manager for all USAF-acquired launch vehicles, and through the spacecraft Single Manager for USAF-acquired spacecraft.

2.1.2.2. For USAF missions will inform the SMC Commander of all significant system changes that occur after the FRR.

2.1.2.3. Is the sole decision authority for the flight worthiness of the integrated stack during the launch countdown. The Mission Director will provide the mission Go/No-Go recommendation to the Launch Decision Authority (Space Wing Commander or designee) after ensuring all reasonable and prudent steps have been taken to ensure systems are flight worthy for launch. A launch cannot proceed without a "Go" for launch from the Mission Director.

2.1.2.4. For USAF missions, derives authority from the Secretary of the Air Force through the Chief of Staff of the Air Force and will report to AFMC/CC through SMC/CC.

### 2.2. Decision to Ship to Launch Base

2.2.1. AFMC will:

2.2.1.1. Ensure all launch vehicle and USAF-acquired spacecraft hardware and software is flight worthy before shipment to the launch base. Discrepancies may be corrected at the launch base on an exception basis.

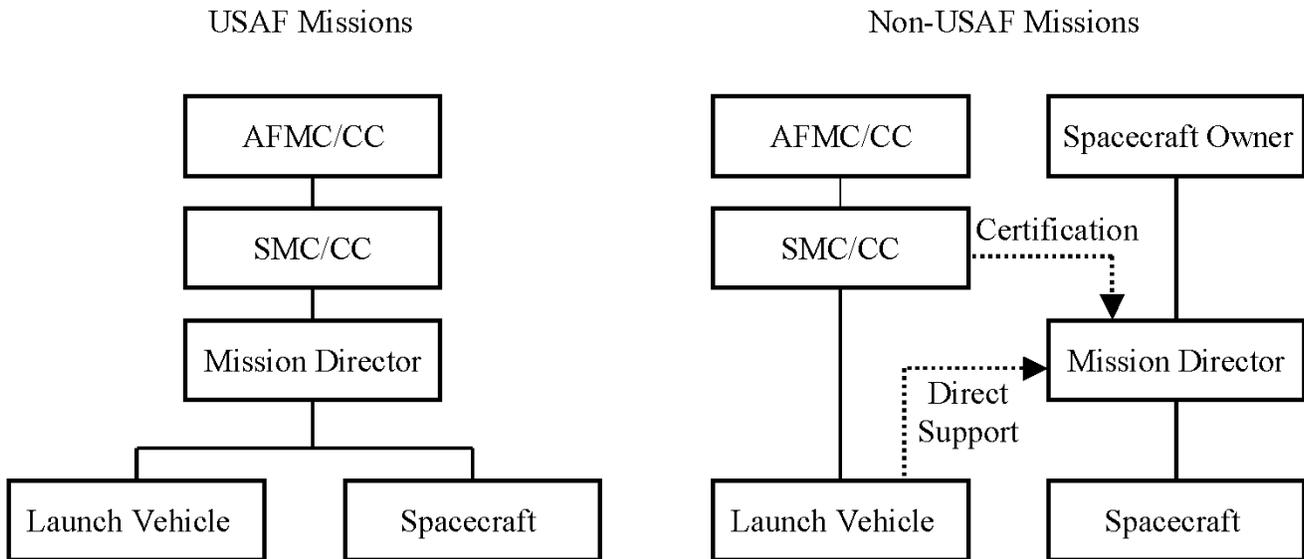
2.2.1.2. In coordination with AFSPC and the Mission Director, direct shipment of the launch vehicle and USAF-acquired spacecraft to the launch base when the flight hardware is ready to proceed through launch base processing and the launch base is ready to receive flight hardware.

2.2.1.3. Ensure SMC/CC appoints the Mission Director for USAF missions.

### 2.3. Launch Base Processing

2.3.1. The reporting structure for launch base processing and flight worthiness is shown in [Figure 1](#).

**Figure 1. Reporting Structure for Launch Vehicle and Spacecraft Processing and Flight Worthiness**



**NOTE:**

SMC/CC is responsible for certifying all USAF launch vehicles, regardless of payload. For non-USAF payloads this certification, for launch vehicle and critical ground systems/interfaces, will be provided to the Mission Director. For non-USAF missions, the Mission Director will receive direct support from the launch vehicle Single Manager and associated AFMC/AFSPC surveillance team to ensure flight worthiness of the integrated launch vehicle and spacecraft.

2.3.2. AFMC will:

- 2.3.2.1. Provide technically proficient personnel to resolve any problems, off-nominal indications, or anomalies encountered during the launch vehicle and USAF spacecraft processing flow.
- 2.3.2.2. Jointly with Mission Director and AFSPC, develop milestone schedule inputs and launch dates for AFSPC review/approval and Range coordination.
- 2.3.2.3. For missions using USAF-acquired launch vehicles, organize and lead joint AFMC/AFSPC surveillance of launch base processing activities using jointly approved surveillance plans. Ensure all processing tasks are completed. Notify the Mission Director of status, significant problems, off-nominal indications, or anomalies observed.
- 2.3.2.4. For missions using USAF-acquired launch vehicles, conduct Mission, Flight, and Incremental Readiness Reviews as necessary to proceed to the next processing milestone. These are done in accordance with AF Space Flight Worthiness Certification 63-series policies and procedures.
- 2.3.2.5. Upon completion of the FRR, the SMC/CC will certify the space flight worthiness of the launch vehicle, USAF-acquired spacecraft, and integrated stack as appropriate in accordance with AF Space Flight Worthiness Certification 63-series policies and procedures.
- 2.3.2.6. Sustain the launch complexes and USAF processing facilities in accordance with AFI

21-108, *Maintenance Management of Space Systems*.

2.3.3. AFSPC will:

2.3.3.1. Provide launch facilities, resources, and scheduling support necessary to support launch vehicle and USAF-acquired spacecraft launch base processing in accordance with the approved Current Launch Schedule Review Board space launch manifest.

2.3.3.2. Provide technically proficient personnel to monitor and verify processing tasks. Personnel will be responsible for ensuring joint surveillance tasks, as delegated by AFMC, are successfully completed, and for ensuring any issues identified during processing are brought to the attention of AFMC.

2.3.3.3. For non-USAF missions, AFSPC will provide resources, as required, to support spacecraft processing.

2.3.3.4. Ensure compliance with safety, environmental, and other regulatory requirements.

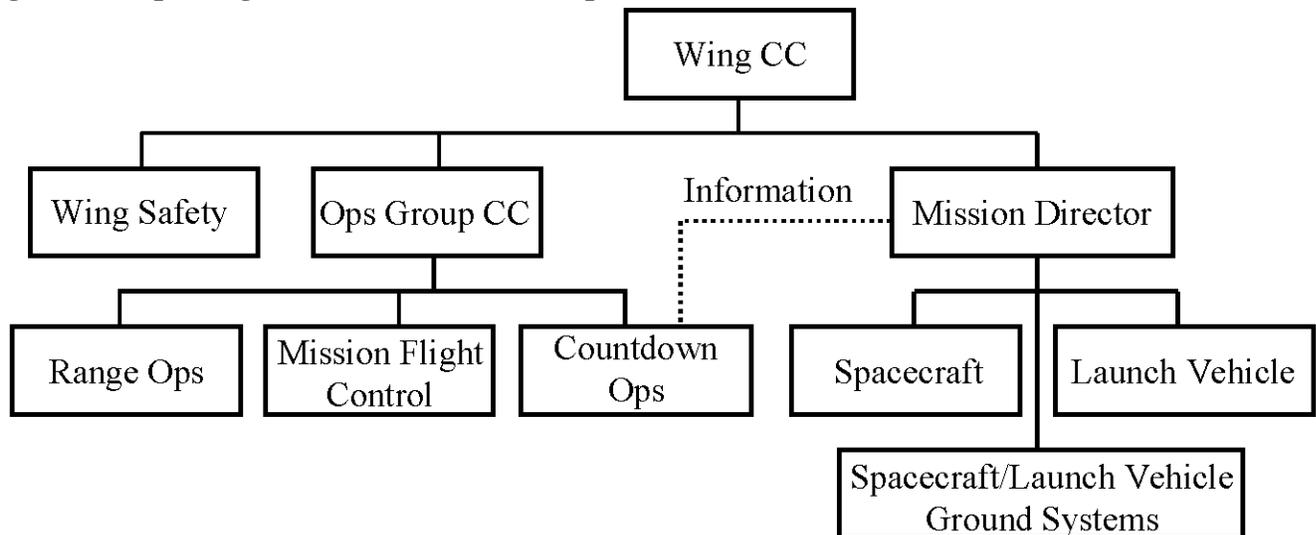
2.3.3.5. Support AFMC and spacecraft provider readiness reviews, as appropriate (e.g., Mission Readiness Review, Flight Readiness Review)

2.3.3.6. Maintain the launch complexes and USAF processing facilities in accordance with AFI 21-108, *Maintenance Management of Space Systems*.

2.3.3.7. Obtain approval from the responsible AFMC Single Manager prior to implementation of any system configuration or maintenance change.

2.4. Launch Operations

2.4.1. The reporting structure for launch operations is shown in **Figure 2**.

**Figure 2. Reporting Structure for Launch Operations****NOTE:**

While countdown operations reports to the Operations Group Commander, two-way communication between countdown operations and the Mission Director is critical for flight worthiness determination and response to any anomalies.

## 2.4.2. AFMC will:

2.4.2.1. Support the AFSPC Launch Readiness Review and launch countdown operations.

2.4.2.2. Notify the Mission Director, SMC/CC and AFSPC of significant problems, off-nominal indications, or anomalies and corrective actions taken by the entire launch team.

2.4.2.3. Determine appropriate responses to launch vehicle or USAF-acquired spacecraft problems, off-nominal indications, or anomalies when flight worthiness of the integrated stack or associated aerospace ground equipment are in question. If required, lead an anomaly resolution team for the launch vehicle and USAF-acquired spacecraft, and prepare corrective actions in concert with AFSPC.

2.4.2.4. Support AFSPC-led anomaly resolution efforts.

## 2.4.3. AFSPC will:

2.4.3.1. For USAF missions, assume responsibility and authority as supported command after the integrated launch vehicle and USAF-acquired spacecraft processing is complete. This responsibility will transfer after the successful completion of the SMC Commander's FRR and AFMC certification of space flight worthiness.

2.4.3.2. Prepare the flight worthy integrated stack to be flight ready.

2.4.3.3. Provide technically proficient, mission-ready personnel to conduct launch countdown, mission flight control and range operations.

2.4.3.4. Through the Space Wing Operations Group Commander or designee, coordinate

countdown operations (launch vehicle and spacecraft), range operations (flight control and weather), and execute the launch countdown. Based on the information, the Operations Group Commander or designee will make a Go/No-Go recommendation to the Launch Decision Authority (Space Wing Commander or designee). The Wing Safety staff will advise the Launch Decision Authority on launch day safety issues through independent safety channels.

2.4.3.5. Conduct a Launch Readiness Review (LRR), normally one day prior to launch, to ensure the launch vehicle, spacecraft, range, launch crew, safety, weather, and all other elements are ready to proceed with the launch countdown. At the LRR, ensure:

2.4.3.5.1. The launch vehicle and USAF-acquired spacecraft are certified flight worthy by AFMC.

2.4.3.5.2. The launch vehicle, spacecraft, launch crews, launch facilities, range, Mission Director, and AFMC are ready to proceed.

2.4.3.5.3. Verify all safety waivers and deviations have been approved and all government safety requirements have been satisfied.

2.4.3.6. Jointly with AFMC and the Mission Director, evaluate launch vehicle or spacecraft problems, off-nominal issues, or anomalies. If a launch vehicle or spacecraft problem, off-nominal issue, or anomaly associated with the integrated stack or associated aerospace ground equipment requires a formal anomaly resolution team, AFSPC will support the AFMC anomaly resolution team efforts as required. AFSPC will lead, with AFMC support, anomaly resolution efforts not associated with the integrated stack or associated aerospace ground equipment. AFSPC will assess anomalies and corrective actions for potential operational mission impact.

2.4.3.7. Through the Launch Decision Authority ensure conduct of a safe launch, lead the launch countdown, and give the final launch order based upon launch vehicle, spacecraft, launch complex, support infrastructure, range, weather, resource protection, and flight readiness.

2.4.3.8. Notify AFMC prior to implementation of any operational change that will affect the Operational Safety, Suitability and Effectiveness of USAF-acquired launch vehicles or USAF-acquired spacecraft.

## 2.5. Post-Flight Activities

2.5.1. AFMC and AFSPC will conduct post-flight reviews following every launch to identify, document, and disseminate lessons learned, mission impacts, and corrective actions.

**3. Interfacing Publications.** This instruction interfaces with AFD 10-12, *Space*; AFD 63-12/AFI 63-1201/AFMCI 63-1201, *Assurance of Operational Safety, Suitability, and Effectiveness (OSS&E)*; AFMD 4, *Air Force Materiel Command (AFMC)*; AFMD 5, *Air Force Space Command*; SMC 63-1201,

*Assurance of OSS&E for Space and Missile Systems; and AFI 12-108, Maintenance Management of Space Systems.*

ROBERT H. FOGLESONG, Lt General, USAF  
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**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFPD 10-12, *Space*, 1 February 1996

AFPD 63-12, *Assurance of Operational Safety, Suitability, and Effectiveness (OSS&E)*,  
1 February 2000

***Abbreviations and Acronyms***

**AFMC**—Air Force Materiel Command

**AFMD**—Air Force Mission Directive

**AFPD**—Air Force Policy Directive

**AFSPC**—Air Force Space Command

**DoD**—Department of Defense

**FRR**—Flight Readiness Review

**LRR**—Launch Readiness Review

**MAJCOM**—Major Command

**SMC**—Space and Missile Systems Center

**SMC/CC**—Head of AFMC's Space and Missile Product Line

***Terms***

**Anomaly**—Discrepancy encountered during execution that the launch team is unable to resolve with pre-approved procedures.

**Flight Readiness**—AFSPC responsibility to orchestrate and conduct pre-flight countdown activities in accordance with approved procedures to prepare the integrated launch vehicle and spacecraft for flight. These activities include such processes as conducting final spacecraft power-up and testing, launch vehicle propellant loading and final propulsion, electrical and hydraulic systems checks and tests, and verification that necessary range assets and facilities are mission capable.

**Flight Worthiness**—AFMC responsibility to ensure the design meets requirements, the hardware is built in accordance with that design, the processes and procedures used in the factory and at the launch base meet requirements, launch base processing is completed in accordance with the approved procedures, and that any anomalous conditions are resolved.

**Non-USAF Mission**—Any mission involving a USAF-acquired launch vehicle and a non-USAF spacecraft. Certain non-USAF missions, where the spacecraft owner chooses to delegate Mission Director responsibility to USAF, should be treated as a USAF mission.

**Off-Nominal Indication**—An unexpected response, value or reading that may or may not require corrective action.

**Operational Effectiveness**—The overall degree of mission accomplishment of a system used by representative personnel in the environment planned or expected for operational employment of the system considering organization, doctrine, tactics, information assurance, force protection, survivability, vulnerability, and threat.

**Operational Safety**—The condition of having acceptable risk to life, health, property, and environment caused by a system when employing that system in an operational environment.

**Operational Suitability**—The degree to which a system can be placed satisfactorily in field use, with consideration given to availability, compatibility, transportability, interoperability, reliability, wartime use rates, maintainability, full-dimension protection, operational safety, human factors, architectural and infrastructure compliance, manpower supportability, logistics supportability, natural environment effects and impacts, and documentation and training requirements.

**Problems**—Discrepancies encountered during execution that the launch team can resolve with pre-approved procedures.

**USAF Mission**—Any mission involving both a USAF-acquired launch vehicle and a USAF-acquired spacecraft.