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**Safety**

**SAFETY RULES FOR US STRIKE AIRCRAFT**

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This instruction implements AFD 91-1, *Nuclear Weapons and Systems Surety*. It applies to operations with US F-15E and F-16C/D aircraft and nuclear weapons dedicated for use with the aircraft. Section A assigns responsibilities and Section B contains the nuclear weapon system safety rules for the weapon systems. The safety rules in Section B can only be changed or supplemented using procedures in AFI 91-102, *Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety Rules*. This instruction does not apply to the Air Force Reserve and Air National Guard.

**SUMMARY OF REVISIONS**

**This document is substantially revised and must be completely reviewed.**

This revision deletes rules applying to F-111E/F aircraft; adds list of authorized weapons; clarifies Hardened Aircraft Shelter and Weapon Storage Vault procedures; deletes references to B61-3 and -4 Signal Selector Switch; includes procedures for performing CJCS-directed Stockpile Emergency Verifications in Hardened Aircraft Shelters containing Weapon Storage Vaults; and establishes PAL procedures for flying operations involving carriage of nuclear weapons in a strike configuration.

**Section A—Authority and Responsibilities**

- 1. Joint Chiefs of Staff (JCS) Direction.** The JCS directs the Chief of Staff, US Air Force, to implement the rules.
- 2. Temporary Limitations.** The Air Force may impose restrictions on application of safety rules.
- 3. Functional Responsibilities:**

- 3.1. The Commander, Air Force Safety Center, must ensure:
  - 3.1.1. The safety rules provide maximum safety consistent with operational requirements.
  - 3.1.2. Units follow the safety rules.
- 3.2. Using major commands (MAJCOM) must:
  - 3.2.1. Ensure their units follow the safety rules.
  - 3.2.2. Ensure safety standards and procedures agree with the safety rules.
  - 3.2.3. Inspect for compliance.
- 3.3. Air Force Materiel Command ensures its manuals, checklists, and technical orders do not conflict with the safety rules.

### ***Section B—Safety Rules***

#### **4. General Information.**

- 4.1. These safety rules apply to the F-15E and F-16C/D aircraft and nuclear weapons dedicated for use with the aircraft. Rules pertaining to Hardened Aircraft Shelters containing Weapons Storage and Security Systems apply regardless of the type aircraft parked in the Hardened Aircraft Shelter.
- 4.2. Safety rules always apply, even during war. A commander may deviate from a specific rule in an emergency, but may not expend a nuclear weapon until authorized by an authenticated emergency war order. DoD Directive (DoDD) 3150.2, *Safety Studies and Reviews of Nuclear Weapon Systems*, December 23, 1996, defines an emergency as “an unexpected occurrence or set of unexpected circumstances in which personnel or equipment unavailability due to accident, natural event or combat may demand immediate action that may require extraordinary measures to protect, handle, service, transport, jettison, or employ a nuclear weapon.”
- 4.3. Do not fly with nuclear weapons until authorized.
- 4.4. Training with nuclear weapons is prohibited.
- 4.5. These rules, weapon system features, operational controls, and technical procedures, ensure US strike aircraft meet the Nuclear Weapon System Safety Standards in DoDD 3150.2.

#### **5. Authorized Weapons.**

- 5.1. B61-3
- 5.2. B61-4
- 5.3. B61-10

**6. Nuclear Identification.** Develop procedures to distinguish nuclear weapons from test or training shapes.

#### **7. Troubleshooting and Use of Equipment, Procedures, and Checklists:**

7.1. Do not use nuclear weapons to troubleshoot faults. Use only equipment and procedures that are consistent with US Air Force-approved publications for nuclear weapons or nuclear weapon systems operations.

7.2. Do not modify aircraft monitoring and control (AMAC), stores management system (SMS), suspension and release systems, handling and test equipment, or any aircraft system that affects nuclear surety without US Air Force approval.

7.3. Approved publications and modifications must conform with weapon system safety rules and meet the DoD Nuclear Weapon System Safety Standards.

**8. Security Criteria.** AFI 31-101, Volume I, *The Air Force Physical Security Program*, AFI 31-101, Volume II, *The Air Force Nuclear Program Standards*, and DoD 5210.41-M (C), *Nuclear Weapon Security Manual*, April 1994, apply.

**9. Tamper Control and Detection.** AFI 91-104, *Nuclear Surety Tamper Control and Detection Programs*, which defines the Two-Person Concept and sealing requirements, applies.

**10. Handling and Storage of Certified Software.** AFI 91-105, *Critical Components*, applies.

**11. Personnel Reliability.** AFI 36-2104, *Nuclear Weapons Personnel Reliability Program*, and DoDD 5210.42, *Nuclear Weapon Personnel Reliability Program (PRP)*, May 25, 1993, apply.

**12. Basic Weapon Configurations .** Use applicable technical orders to verify B61-3, -4, and -10 is configured correctly.

**13. Basic Aircraft Configurations.** Place aircraft in the following configuration prior to loading nuclear weapons.

**13.1. F-15E:**

13.1.1. Nuclear Consent switches in the SAFE position.

13.1.2. Nuclear Consent switch guard down, safety wired and sealed.

13.1.3. Master Arm Switch in the OFF position.

**13.2. F-16C/D:**

13.2.1. Nuclear Consent switch in the OFF position.

13.2.2. Nuclear Consent switch guard down, safety wired, and sealed.

13.2.3. Master Arm Switch in the OFF position.

**14. Storage, Maintenance, Testing, Ground Transportation, Loading, and Un loading:**

14.1. Store nuclear weapons in US Air Force-approved, locked, and secured facilities.

14.2. Use applicable technical data to verify weapon configuration prior to handling.

14.3. Load nuclear weapons only on aircraft certified mission capable for the mission to be performed.

14.4. Perform nuclear weapon maintenance only in a Maintenance and Inspection Facility or in a hardened aircraft shelter (HAS).

14.5. Major nuclear weapon maintenance in a HAS must be performed using a weapons maintenance truck (WMT). (Major maintenance is defined as any activity in which weapon major subassemblies are separated.)

14.5.1. Prior to initiating unlock procedures to raise the Weapon Storage Vault (WSV) or otherwise introducing a nuclear weapon into the HAS for major maintenance:

14.5.1.1. Remove all conventional munitions and aircraft from the HAS.

14.5.1.2. Position the WMT at least seven feet from the HAS walls or attachments.

14.5.2. Do not begin any major maintenance if lightning potential is forecast to occur before task completion.

14.5.3. If lightning becomes a threat when major maintenance is in progress, isolate the WMT from the HAS by disconnecting electrical power, communications lines, and ground lines. Operations may continue on auxiliary power unit (APU) power to reach a safe stopping point in the procedure, provided the APU exhaust hose is equipped with an electrical isolation feature.

14.5.4. If lightning actually occurs within five nautical miles, isolate the WMT as described above and cease operations as soon as the weapon can be brought to a safe configuration.

**15. Logistics Movement of Nuclear Weapons by Cargo Aircraft.** AFI 91-115, *Safety Rules for Nuclear Logistics Transport by the Prime Nuclear Airlift Force*, applies.

**16. Operations Involving Nuclear Weapons and Conventional Munitions In a Hardened Aircraft Shelter (HAS) Without a Weapons Storage Vault (WSV).** (For operations with a WSV, see paragraph 17.) Simultaneous presence of conventional munitions (except for air-to-air missiles) and nuclear weapons is prohibited except during nuclear generations and subsequent alert operations. Do not position nuclear weapons directly in front of or behind forward firing ordnance.

16.1. Simultaneous presence of conventional munitions (except for air-to-air missiles) and nuclear weapons during practice generations, practice alerts, exercises, or evaluations is prohibited.

16.2. Authorized operations involving both nuclear and conventional munitions in a HAS (i.e. nuclear generation and subsequent alert operations) always require MAJCOM approved plans. The appropriate group commander must authorize each operation prior to start.

16.3. Before introducing nuclear weapons into a HAS to load onto an aircraft for generation and subsequent alert operations:

16.3.1. Have qualified munitions personnel verify that conventional munitions, if present, are safed.

16.3.2. Fuel the mission-capable aircraft and prepare it for loading, as required.

16.3.3. Cease aircraft maintenance operations.

16.3.4. Ensure the net explosive weight (NEW) of conventional munitions inside the HAS does not exceed 10,000 pounds.

16.4. When a nuclear weapon-loaded aircraft is in a HAS:

16.4.1. Conduct engine runs only when necessary to check aircraft status, perform maintenance, and prepare for authorized flying operations.

16.4.2. Conduct fueling operations only to maintain the aircraft for its mission requirements.

16.4.3. Conduct all other operations only as approved by the appropriate group commander in accordance with appropriate directives and technical data.

16.5. Remove all conventional munitions and aircraft from the HAS before performing any major maintenance on nuclear weapons inside a HAS.

**17. Operations Involving Both Nuclear Weapons and Conventional Munitions in a Hardened Aircraft Shelter with a Weapons Storage Vault.** (For operations in a HAS without a WSV, see paragraph 16.) Simultaneous presence of conventional munitions (except air-to-air missiles) and nuclear weapons (exposed or with the vault not down and locked) is prohibited except during nuclear generations, subsequent alert operations and CJCS-directed Stockpile Emergency Verifications (SEV).

17.1. Simultaneous presence of conventional munitions (except for air-to-air missiles) and nuclear weapons during practice generations, practice alerts, exercises, or evaluations is prohibited.

17.2. Authorized operations involving both nuclear and conventional munitions in a HAS with a WSV (i.e. nuclear generation, subsequent alert operations and CJCS-directed SEV) always require MAJCOM approved plans. The appropriate group commander must authorize each operation prior to start.

17.3. Control the vault processor, authentication unit, and data authenticator under Two-Person Concept when the WSV is unlocked.

17.4. Do not conduct fuel-cell maintenance operations in a HAS containing a nuclear weapon-loaded WSV.

17.5. Remove aircraft from a HAS prior to performing maintenance requiring the unlock of a nuclear weapon-loaded WSV.

17.6. Remove all conventional munitions and the aircraft from the HAS before performing any major maintenance on nuclear weapons inside a HAS.

17.7. In a HAS with a nuclear weapon-loaded WSV, conventional munitions may not exceed 10,000 pounds net explosive weight (NEW).

17.8. Conventional munitions (except for wall-mounted, air-to-air missiles) must be positioned at least 15 feet from the WSV. Do not position forward firing ordnance with the nose or exhaust pointed directly at an opened nuclear weapon loaded WSV.

17.8.1. The preceding restriction does not limit towing or taxi operations of aircraft loaded with conventional munitions into or out a HAS containing a WSV.

17.9. Perform normal day-to-day aircraft maintenance operations only when the WSV is down and locked.

17.10. Unlock the WSV only after complying with the appropriate security measures.

17.11. Before raising a nuclear weapon-loaded WSV to perform nuclear generation actions:

17.11.1. Have qualified munitions personnel verify all conventional munitions are safed.

17.11.2. Fuel the mission capable aircraft and prepare it for loading, as required.

17.11.3. Cease aircraft maintenance operations.

17.12. Performing a CJCS-directed Stockpile Emergency Verification (SEV) is the only occasion authorized, other than nuclear generation and subsequent alert, when the WSV may be opened with conventional munitions present in the HAS. When performing a SEV in a HAS where conventional munitions are present the WSV will be unlocked and opened only long enough to record the required nuclear weapon data.

17.12.1. Prior to initiating unlock procedures to raise the WSV:

17.12.1.1. Have qualified munitions personnel verify all conventional munitions are safed.

17.12.1.2. Ensure the aircraft is properly grounded.

17.12.1.3. Ensure all aircraft munitions are electrically and mechanically safed.

17.12.1.4. Ensure the nose or exhaust of forward firing ordnance will not point directly at an opened nuclear weapon-loaded WSV.

17.12.2. Only personnel required to perform the SEV will remain in the HAS.

17.13. When a nuclear weapon-loaded WSV is not down and locked the following restrictions apply:

17.13.1. Do not move aircraft into or out of the HAS.

17.13.2. Move only mission-essential equipment into or out of the HAS.

17.13.3. Do not perform engine runs, fueling, or liquid oxygen servicing operations.

17.13.4. Do not perform conventional integrated combat turnaround procedures.

17.13.5. Perform only those operations approved by the appropriate group commander in accordance with appropriate directives and technical data.

17.13.6. If a fuel, liquid oxygen, hydrazine, or similar hazardous substance release within the HAS is deemed an emergency and poses a threat to the nuclear weapons, return the nuclear weapon-loaded WSV to a fully down position until the emergency is terminated by proper authority.

17.14. Maximize use of the WSV safety features by keeping the nuclear weapon-loaded WSV fully down except when the specific operation being performed requires vault access.

17.15. When a nuclear weapon-loaded aircraft is in a HAS:

17.15.1. Conduct engine runs only when necessary to check aircraft status, perform maintenance, or prepare for authorized flying operations.

17.15.2. Conduct fueling operations only to maintain the aircraft for its mission requirements.

17.15.3. Conduct all other operations only as approved by the appropriate group commander in accordance with appropriate directives and technical data.

**18. Onbase Dispersal of Nuclear Weapons.** This paragraph applies only to units without the WS3:

18.1. Disperse nuclear weapons from weapons storage areas when directed by appropriate authority and according to MAJCOM-approved plans.

18.2. Disperse weapons only to the following locations:

18.2.1. An empty HAS.

18.2.2. A HAS containing support equipment or war readiness support kits not posing a hazard to the weapons.

18.2.3. A HAS containing no more than one aircraft (with or without weapons) parked nose out. (Only minor maintenance, of the type authorized on nuclear weapon-loaded aircraft, is permitted in the HAS.)

18.2.4. An empty bay of a semihardened fuel truck shelter (FTS). In a double-bay FTS, a fuel truck may be housed in the adjacent bay. Do not store nuclear weapons and fuel trucks in the same bay.

18.3. Do not use nuclear weapons for onbase dispersal training, practice alerts, exercises, inspections, or evaluations.

## 19. Ground Operations Involving Nuclear Weapon-Loaded Aircraft:

19.1. Apply power to a loaded nuclear weapon only for authorized permissive action link (PAL) operations or to monitor the weapon. Keep weapon monitoring to a minimum.

19.2. Apply power to a nuclear weapon-loaded aircraft only to:

19.2.1. Perform maintenance.

19.2.2. Perform authorized preflight operations.

19.2.3. Start the engine or engines.

19.2.4. Warm up equipment.

19.2.5. Monitor the radio.

19.2.6. Perform authorized PAL operations.

19.3. Keep aircraft towing to a minimum.

19.3.1. A qualified and authorized individual must be in the cockpit during towing.

19.3.2. A Two-Person Concept team must verify the basic aircraft configuration when towing is complete.

19.4. Engine Runup.

**19.4.1. F-15E.** Allow only authorized aircrews to perform engine runup (Two-Person Concept applies).

**19.4.2. F-16C/D.** Allow only an authorized pilot to conduct engine runup.

19.4.3. Use a physical barrier to prevent an unauthorized takeoff during engine runup.

19.4.4. Have a Two-Person Concept team verify the basic aircraft configuration following engine runup.

19.5. Run the engine or engines only if necessary to:

19.5.1. Check aircraft status.

19.5.2. Perform authorized maintenance.

19.5.3. Prepare for authorized flying operations.

19.5.4. Conduct practice alerts, exercises, evaluations, or inspections (except as restricted when conventional munitions are in a HAS with nuclear weapons or when a nuclear weapon-loaded vault is not down and locked).

19.6. Do not move a nuclear weapon-loaded aircraft under its own power unless:

19.6.1. For authorized flying operations.

19.6.2. Necessary to preserve the safety of the weapon system.

19.7. Fuel the aircraft only to maintain its mission requirements.

## **20. Flying Operations Involving Carriage of Nuclear Weapons in a Nonstrike Configuration:**

20.1. Conduct only when directed by appropriate authority.

20.2. Put nuclear weapons in their basic configurations (paragraph 12.).

20.3. Verify that the PAL is locked prior to loading nuclear weapon.

20.4. Do not make electrical or mechanical pullout connections between the nuclear weapons and the aircraft.

20.5. Lift the Nuclear Consent Switch guards and operate the controls using approved checklists when weapon jettison is authorized.

20.6. Plan flight routes to avoid populated areas to the maximum extent possible.

## **21. Flying Operations Involving Carriage of Nuclear Weapons in a Strike Configuration:**

21.1. Conduct only when directed by appropriate authority.

21.2. Lift the Nuclear Consent switch guards and operate the controls using approved checklists when:

21.2.1. Weapon jettison is authorized.

21.2.2. Prearming and release of nuclear weapons is authorized.

21.3. Plan flight routes to avoid populated areas to the maximum extent possible.

21.4. If loss of the aircraft is anticipated or a weapon jettison becomes necessary, relock (Disenable) PAL if time and conditions permit.

**22. Operations Involving the Lateral Dispersal of Nuclear Weapons for Survival.** Lateral dispersal is a wartime contingency movement of nuclear weapons by US transportation from the main operating base (MOB) to a dispersed operating location (DOL) and subsequent alert operations.

22.1. Disperse nuclear weapons when directed by appropriate authority and according to MAJ-COM-approved plans.

22.2. Use appropriate technical orders to prepare for subsequent alert operations when aircraft and nuclear weapons arrive at the DOL.

22.3. Position nuclear weapon-loaded aircraft in a HAS or alternate shelter (if available) according to MAJCOM-approved plans.

22.4. Don't use nuclear weapons for lateral dispersal training, exercises, inspections, or evaluations.

22.5. Configure nuclear weapons for carriage on tactical fighter aircraft using the following safety priorities:

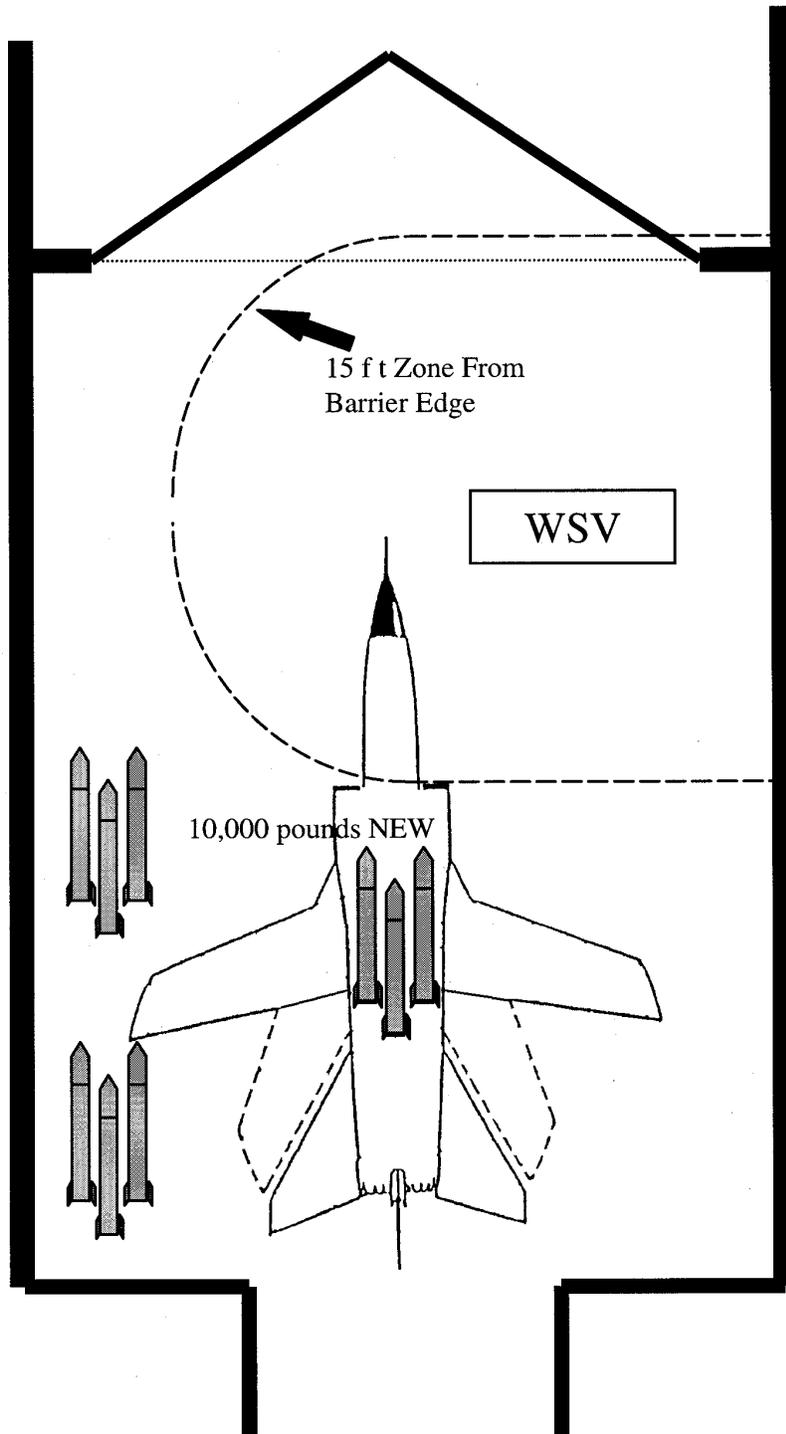
22.5.1. Nonstrike configuration.

22.5.2. Strike configuration.

**23. PAL Procedures.** Use PAL codes and PAL devices only as directed by appropriate authority.

**24. Command Disable (CD) Procedures.** Use CD codes and CD equipment only as directed by appropriate authority.

Figure 1. Placement of Munitions 15 Feet from WSV.



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