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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*, and AFI 91-101, *Air Force Nuclear Weapons Surety Program*. 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 changed all references to Hardened Aircraft Shelters (HAS) in the rules to Protective Aircraft Shelters (PAS) based on the change in theater reference to these shelters; clarified the definition of training in relation to the rule prohibiting training with nuclear weapons and added use of nuclear weapons for exercises IAW DoD 3150.2M; *DoD Nuclear Weapon System Safety Manual (U)*, dated 23 December 1996; deleted the requirement to verify Nuclear Weapon Configuration as this requirement no longer exists based on modern nuclear weapons design incorporated in these weapons; clarified the requirements to distinguish test and training shapes from nuclear weapons; added the requirement for nonnuclear assurance verification for test assets IAW DoD 3150.2M; added the ability to obtain approval to use alternate maintenance procedures if the Weapons Maintenance Truck (WMT) is not serviceable, available, or useable; addressed the requirement to maintain 7-foot clearance around the WMT and although this requirement remains intact, exceptions to this requirement were added under specific weapon configurations or with specific facility and WMT design feature configurations; removed the WMT grounding requirement to facilitate WMT isolation for lightning protection; recognized the availability of non-conductive WMT auxiliary power unit (APU) exhaust hoses; clarified the definition of simultaneous presence of conventional munitions during practice generations, practice alerts, exercises or evaluations,

restricting amounts to only aircraft loaded and one additional load of air-to-air missiles, chaff, flares, and aircraft gun ammunition; further defined fuel cell maintenance; clarified requirements that must be met in order to allow aircraft to remain in a PAS while performing maintenance, and what maintenance can be performed; specifically addressed air-to-air missiles, chaff, flares and aircraft gun ammunition being loaded in preparation for strike, authorizing a mechanically and electrically safed configuration to exist while strike preparation continues; weapon storage vault (WSV) may be opened with properly configured self protective munitions loaded and pointing towards the vault; eliminated verbiage allowing only wall mounted air-to-air missiles within 15 feet of the WSV so as to allow aircraft mounted air-to-air missiles to be positioned within 15 feet of the WSV; removed the rule requiring the control of the vault processor, authentication unit and data authentication unit under the Two-Person Concept when the WSV is unlocked as existing regulatory guidance provides adequate and more accurate guidance for controlling these items; deleted all references to Lateral Dispersal based upon input from the USAFE, EUCOM, and SHAPE staffs. A (I) indicates a change or addition.

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 Guidance.

4.1. These safety rules apply to units that operate the F-16C/D and/or F-15E strike aircraft and/or possess the nuclear weapons dedicated for use with these aircraft. Rules pertaining to PAS containing nuclear weapons-loaded Weapons Storage and Security Systems (WS3) apply regardless of the type aircraft parked in the PAS.

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, *DoD Nuclear Weapon System Safety Program*, December 23,

1996, defines an emergency as “an unexpected occurrence or set of 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. Nuclear weapons may be used for exercises when their use is specifically authorized by SACEUR or designated authority except as restricted elsewhere in this instruction.

4.6. 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.

4.7. Temporary Limitations. The US Air Force may impose more stringent restrictions on application of safety rules.

5. Authorized Weapons:

5.1. B61-3

5.2. B61-4

5.3. B61-10

6. Nuclear Identification. Ensure test and training shapes can be distinguished from nuclear weapons.

7. Nonnuclear Assurance. IAW DoD 3150.2-M, Appendix A, Paragraph B11, “Verification that a nuclear warhead is not present in a test assembly must be made using nonnuclear assurance procedures at the last practical opportunity agreed on by the DoD and/or Department of Energy (DOE) before the conduct of an operational test.”

8. Troubleshooting and Use of Equipment, Procedures, and Checklists.

8.1. 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.

8.2. 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.

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

9. 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.

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

- 11. Handling and Storage of Certified Software.** AFI 91-105, *Critical Components*, applies.
- 12. Personnel Reliability.** AFI 36-2104, *Nuclear Weapons Personnel Reliability Program*, and DoDD 5210.42, *Nuclear Weapon Personnel Reliability Program (PRP)*, May 25, 1993, apply.
- 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 SAFE position.
 - 13.1.4. Ensure impulse cartridges are not installed in the wing or centerline pylon breaches when nuclear weapons will be loaded on those stations.
 - 13.2. F-16C/D (Forward Cockpit):
 - 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 Unloading.**
 - 14.1. Store nuclear weapons in US Air Force-approved, locked, and secured facilities.
 - 14.2. Use applicable technical data to verify weapon condition 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 PAS.
 - 14.5. Major nuclear weapon maintenance in a PAS must be performed using a WMT. (Major maintenance is defined as any activity in which weapon major subassemblies are separated.)
 - 14.5.1. If the WMT is unserviceable, unavailable, or unusable, use of Air Force Safety Center (AFSC) and MAJCOM approved alternate maintenance procedures is authorized. Use of alternate maintenance procedures will be approved by the MAJCOM on a case by case basis.
 - 14.5.2. Prior to initiating unlock procedures to raise the WSV or otherwise introducing a nuclear weapon to the PAS for major maintenance:
 - 14.5.2.1. Remove all conventional munitions and aircraft from the PAS.
 - 14.5.2.2. Maintain at least seven feet between the WMT/weapon (this includes WMT stairs and associated support equipment, but excludes items required to be disconnected IAW para. 14.5.4.) and the PAS walls/ceiling, metallic attachments and objects unless:
 - 14.5.2.2.1. Weapon electrical/lightning isolation design features are intact, or

14.5.2.2.2. PAS's and/or WMT's design features combined with specific maintenance procedures, provide appropriate electrical energy isolation as determined by technical evaluation and approval by the AFSC.

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

14.5.4. If lightning becomes a threat when major maintenance is in progress, isolate the WMT from the PAS by disconnecting electrical power and communications lines. Assure the WMT is isolated and not grounded to the shelter. Operations may continue on APU power to reach a safe configuration in the procedure, provided the APU exhaust hose is non-conductive or equipped with a lightning isolation feature.

14.5.5. 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 in a PAS Without a Weapons Storage Vault (WSV). (For operations with a WSV, see paragraph 17.) Simultaneous presence of conventional munitions and nuclear weapons is prohibited except during nuclear generations and subsequent alert operations.

16.1. Simultaneous presence of conventional munitions (except for aircraft loaded and one additional load of air-to-air missiles, chaff, flares, and aircraft gun ammunition) 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 PAS (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 PAS to load onto an aircraft for generation and subsequent alert operations:

16.3.1. Have qualified munitions personnel verify that all 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 PAS does not exceed 10,000 pounds.

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

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

16.4.2. Conduct fueling operations only when necessary 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 PAS before performing any major maintenance on nuclear weapons inside a PAS.

17. Operations in a PAS with a WSV. (For operations in a PAS without a WSV, see paragraph 16.) Simultaneous presence of conventional munitions and nuclear weapons (exposed or with the vault not down) is prohibited except during nuclear generations, subsequent alert operations and CJCS-directed Stockpile Emergency Verifications (SEV). Maximize the use of the WSV surety features by keeping the nuclear-loaded WSV down and locked unless the specific operation being performed requires vault access.

17.1. Simultaneous presence of conventional munitions (except aircraft loaded and one additional load of air-to-air missiles, chaff, flares, and aircraft gun ammunition) and nuclear weapons (exposed or with the vault not down) during practice generations, practice alerts, exercises, or evaluations is prohibited.

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

17.3. Do not conduct open fuel-cell maintenance operations in a PAS containing a nuclear weapon-loaded WSV.

17.4. Only aircraft not loaded with live munitions (except for captive air-to-air missiles, chaff, flares, and aircraft target practice ammunition) and associated ground support equipment can remain in the PAS while performing maintenance on the WSV, or minor weapons maintenance in the WSV, provided all other activities within the PAS are terminated.

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

17.6. In a PAS with a nuclear weapon-loaded WSV, conventional munitions may not exceed 10,000 pounds NEW.

17.7. Conventional munitions (except for air-to-air missiles) must be positioned no closer than 15 feet from the WSV. Do not position forward firing munitions in storage with the nose or exhaust pointed directly at an opened nuclear weapon-loaded WSV. Air-to-air missiles, chaff, flares, and aircraft gun ammunition loaded in preparation for strike are authorized as long as they are electrically and mechanically safed, as applicable.

17.7.1. If the placement of the WSV, the physical dimensions of the PAS, and the size of a single aircraft are such that the single aircraft (for example, PA-200 or A-7 in 1st generation PAS) cannot have bombs loaded to meet the 15-foot limit from the WSV, then the following restrictions apply when loading conventional bombs in the PAS:

17.7.1.1. Park aircraft as far from the WSV as practical.

17.7.1.2. No conventional weapon in the PAS (on or off the aircraft) may exceed 445 pounds NEW each.

17.7.1.3. Total NEW in the PAS will not exceed 5,500 pounds.

17.7.1.3.1. During combat contingency operations, increased hostilities or wartime opera-

tions, the appropriate group commander may authorize an increase in the total NEW not to exceed 8,000 pounds.

17.7.1.4. All conventional munitions not loaded on the aircraft will be at least 25 feet from the WSV.

17.7.1.5. Do not exceed 445 pounds NEW per aircraft weapon station.

17.7.1.6. Do not exceed 4 aircraft-loaded bombs within 15 feet of the WSV.

17.7.1.7. No aircraft-loaded bomb may be closer to the WSV than 5.5 feet.

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

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

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

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

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

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

17.10.3. Cease aircraft maintenance operations.

17.11. When performing a SEV in a PAS where conventional munitions are present, the WSV will be unlocked and opened only long enough to record the required nuclear weapon data.

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

17.11.1.1. Have qualified personnel verify all conventional munitions in the PAS are electrically and mechanically safed, as applicable.

17.11.1.2. Ensure aircraft is properly grounded.

17.11.1.3. Ensure the nose or exhaust of forward firing munitions in storage will not point directly at an opened nuclear weapon-loaded WSV.

17.11.1.4. Cease all other operations within the PAS.

17.11.2. Only personnel required to perform the SEV will remain in the PAS.

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

17.12.1. Do not move aircraft into or out of the PAS.

17.12.2. Move only mission essential equipment into or out of the PAS.

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

17.12.4. Do not perform conventional integrated combat turnaround procedures.

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

17.13. If a fuel, liquid oxygen, hydrazine, or similar hazardous substance release within the PAS 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. The WSV need not be locked when it is placed in the down position between phases of an operation (e.g. maintenance, generation exercises).

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

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 when necessary 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 WSV:

18.1. Disperse nuclear weapons from weapons storage areas only 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 PAS.

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

18.2.3. A PAS 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 PAS).

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 training, practice alerts, exercises, or evaluations involving on base dispersal.

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 power applications to a minimum.

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

19.2.1. Perform authorized 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. Have a Two-Person Concept team 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.

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 other than air-to-air missiles, chaff, flares, and aircraft gun ammunition are in a PAS with nuclear weapons or when a nuclear weapon-loaded WSV 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. When 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. Verify that the PAL is locked prior to loading nuclear weapon.

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

20.4. Lift the Nuclear Consent switch guards and operate the controls using approved checklists only when weapon jettison is authorized.

20.5. 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 only when:

21.2.1. Weapon jettison is authorized.

21.2.2. Prearming and release of nuclear weapons are 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 weapon jettison becomes necessary, relock (Disenable) PAL if time and conditions permit.

22. PAL Procedures. Use PAL codes and PAL devices only as directed by appropriate authority. Relock (Disenable) PAL if a strike mission is aborted or terminated.

23. 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.

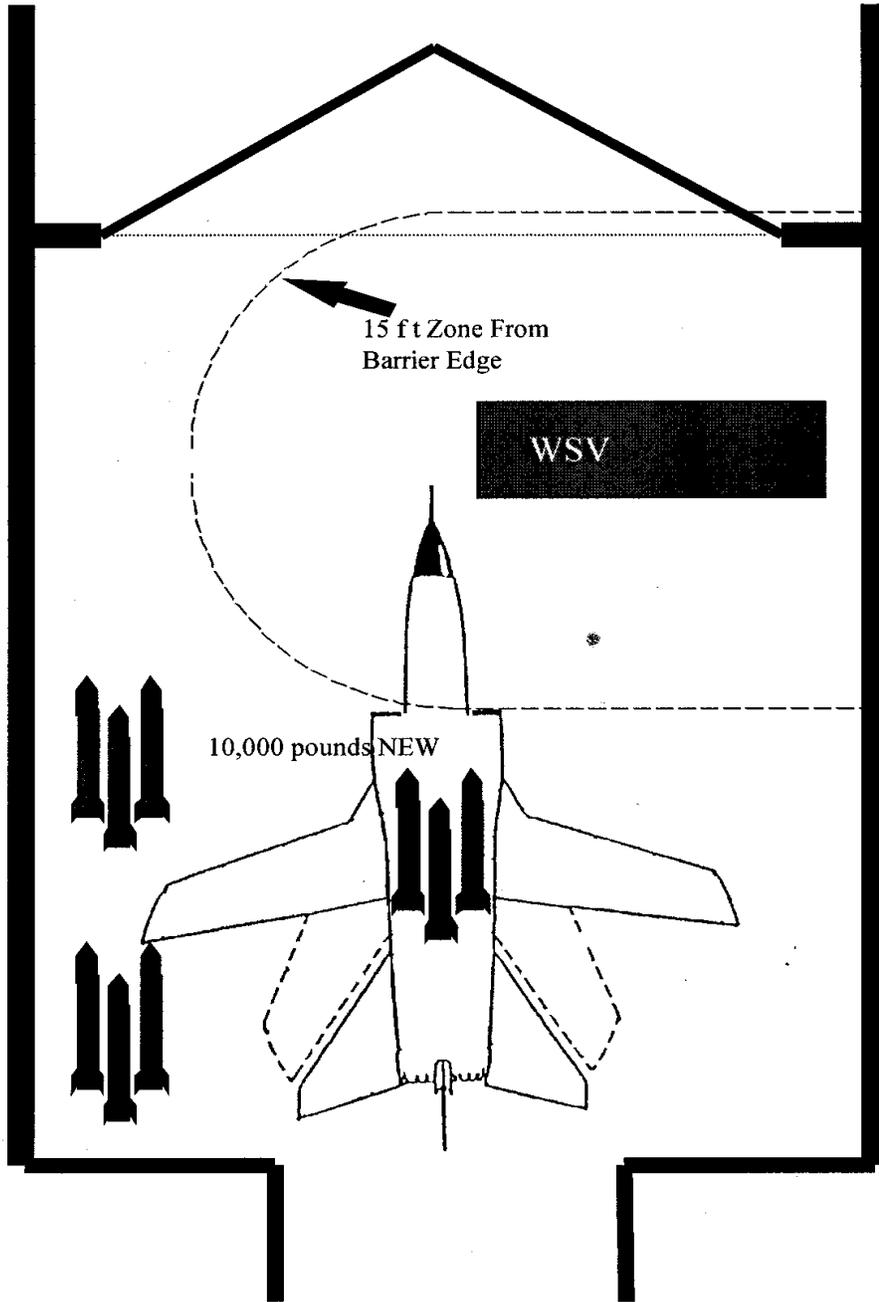
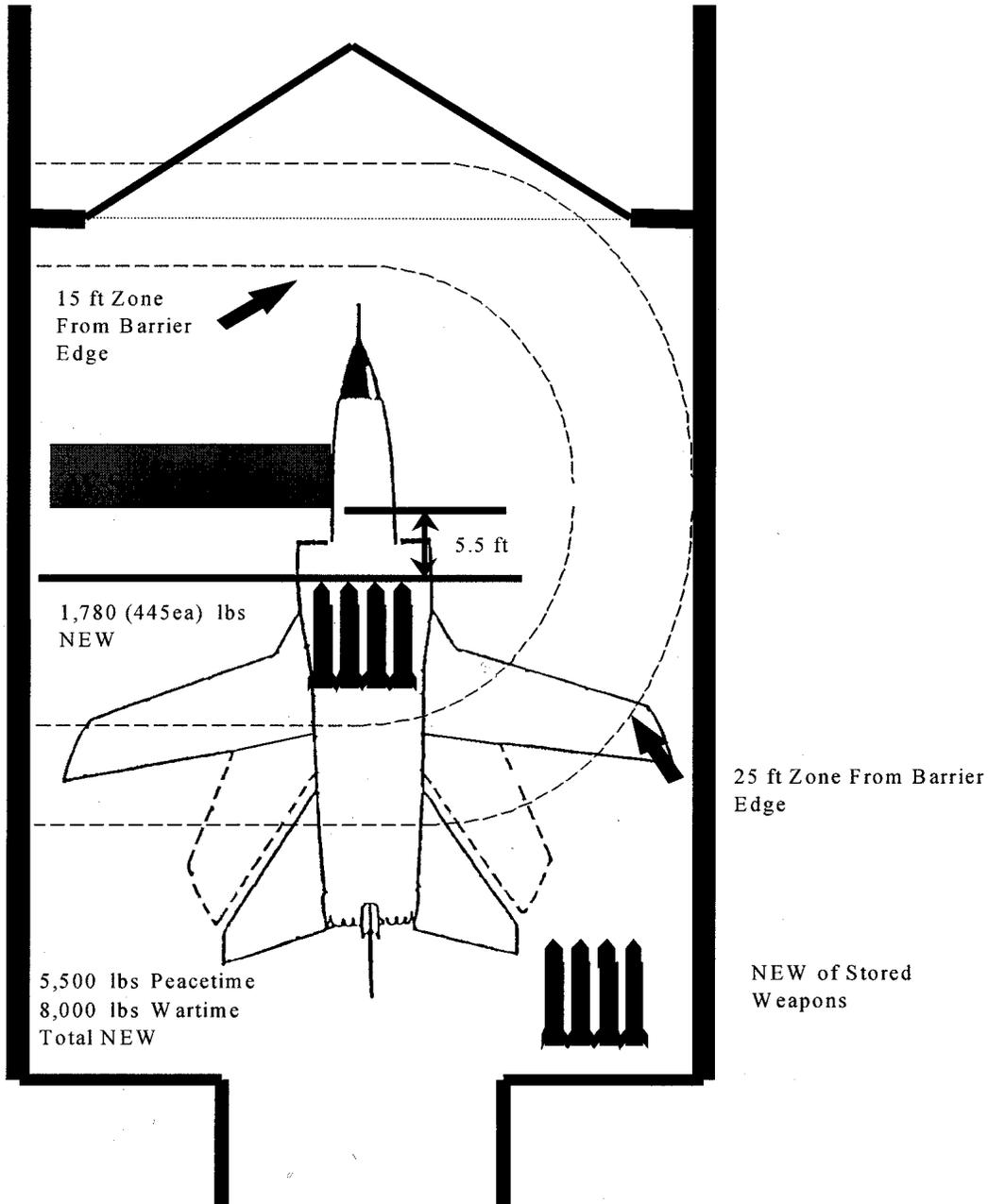


Figure 2. Placement of Munitions When 15-Foot Restriction Cannot Be Met.



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Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

DoD 3150.2, *DoD Nuclear Weapon System Safety Program*

DoD 3150.2M, *DoD Nuclear Weapons System Safety Program Manual*

DoD C-5210.41M, *Nuclear Weapon Security Manual (U)*,

DoD Directive 5210.42, *Nuclear Weapon Personnel Reliability Program*

AFPD 91-1, *Nuclear Weapons and Systems Surety*

AFI 31-101 Volume I, *The Air Force Physical Security Program*

AFI 31-101 Volume II, *The Air Force Nuclear Surety Program Standard*

AFI 36-2104, *Nuclear Weapons Personnel Reliability Program*

AFI 91-101, *Air Force Nuclear Weapons Surety Program*

AFI 91-102, *Nuclear Weapons System Safety Studies, Operational Safety Reviews, and Safety Rules*

AFI 91-104, *Nuclear Surety Tamper Control and Detection Programs*

AFI 91-105, *Critical Components*

AFI 91-115, *Safety Rules For Nuclear Logistics Transport By The Prime Nuclear Airlift Force*

Abbreviations and Acronyms

AFSC—Air Force Safety Center

AMAC—Aircraft Monitoring and Control

APU—Auxiliary Power Unit

CD—Command Disable

CJCS—Chairman Joint Chiefs of Staff

DoD—Department of Defense

DOE—Department of Energy

EUCOM—European Command

FTS—Fuel Truck Shelter

JCS—Joint Chiefs of Staff

MAJCOM—Major Command

NEW—Net Explosive Weight

PAL—Permissive Action Link

PAS—Protective Aircraft Shelter

PDO—Publishing Distribution Office

PRP—Personnel Reliability Program

SEV—Stockpile Emergency Verification

SHAPE—Supreme Headquarters Allied Powers Europe

SMS—Stores Management System

USAFE—United States Air Forces Europe

WMT—Weapons Maintenance Truck

WSV—Weapons Storage Vault

WS3—Weapons Storage and Security System