

**BY ORDER OF THE  
SECRETARY OF THE AIR FORCE**

**AIR FORCE INSTRUCTION 91-111**

**26 OCTOBER 2011**



*Safety*

**SAFETY RULES FOR US STRATEGIC  
BOMBER AIRCRAFT**

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This instruction implements AFD 91-1, Nuclear Weapons and Systems Surety. This publication is consistent with AFD 13-5, Nuclear Enterprise. It applies to operations with B-52H and B-2A aircraft and nuclear weapons dedicated for use with the aircraft. Section A assigns responsibilities. Section B contains each nuclear weapon systems' safety rules. The safety rules in Section B may only be changed or supplemented using procedures in AFI 91-102, Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety Rules. See Attachment 1 for abbreviations and acronyms used in this instruction. This instruction applies to all Air Force (AF), Air Force Reserve Command (AFRC), and Air National Guard (ANG) units. Send major command (MAJCOM) supplements to this Instruction to AFSC/SEW, 9700 G Avenue, Kirtland AFB NM 87117-5670 for review/coordination before publication. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, Management of Records, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afirms/afirms/afirms//rims.cfm>. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, Recommendation for Change of Publication; route AF Form 847s from the field through the appropriate functional's chain of command.

**SUMMARY OF CHANGES**

Clarified verbiage to ensure differentiation between nuclear and non-nuclear munitions. Clarified the status of strategic bomber aircraft to a critical component when operationally coded components are installed (paragraph 10). Moved instructions regarding ground operations from

paragraph 15 to paragraph 17 for consistency. Clarified procedures for Command Disable during flying operations involving carriage of nuclear weapons in a strike configuration. Administrative changes for ease of reading and clarification. Updated applicable references.

### ***Section A—Authority, Limitations, and Responsibilities***

**1. Secretary of Defense Direction:** The Secretary of Defense has directed the Secretary of the Air Force to implement the rules.

**2. Temporary Limitations.** The Air Force may impose restrictions that are more strict than those contained in safety rules, but may not unilaterally change the safety rules.

### **3. Functional Responsibilities.**

3.1. The Commander, Air Force Safety Center:

3.1.1. Ensures that the safety rules work, providing maximum safety consistent with operational requirements.

3.1.2. Ensures that units follow the safety rules

3.2. Using Major Commands (MAJCOM):

3.2.1. Ensure that their units follow the safety rules.

3.2.2. Ensure that all safety standards and procedures agree with the approved safety rules.

3.2.3. Inspect for compliance.

3.3. Air Force Materiel Command (AFMC) ensures that its manuals, checklists, and technical orders do not conflict with the safety rules.

### ***Section B—Safety Rules***

**4. General Guidance.** Per DoD 3150.2-M, DoD Nuclear Weapon System Safety Program Manual, general safety rules apply to all nuclear weapons and nuclear weapon systems. General safety rules primarily apply safety policy and shall be included as part of the Air Force's safety rules package. Safety rules always apply, even during war.

4.1. Nuclear weapons shall not be intentionally exposed to abnormal environments except in an emergency.

4.2. Nuclear weapons shall not be used for training or for troubleshooting (i.e., to confirm the existence of a fault, aid in fault isolation, or verify that a fault has been corrected except as explicitly allowed by a specific safety rule.)

4.3. Nuclear weapons may be used for exercises except when explicitly prohibited by specific safety rules.

4.4. Only certified procedures, personnel, equipment, facilities, and organizations, authorized by the appropriate level of authority, shall be employed to conduct nuclear weapon system operations.

- 4.5. The total number of personnel performing nuclear weapon system operations shall be held to the minimum consistent with the operations performed.
- 4.6. At least two authorized persons must be present during any operation with a nuclear weapon, except when authorized by a specific safety rule; i.e., alert fly. They must be able to detect incorrect or unauthorized procedures in the task being performed. They must also have knowledge of and understand applicable safety and security requirements.
- 4.7. Personnel that have physical access to nuclear weapons must be qualified under the PRP, in accordance with DoD Instruction 5210.42, Nuclear Weapon Personnel Reliability Program (PRP).
- 4.8. Physical security will be maintained, in accordance with DoD Directive S-5210.41, Security Policy for Protecting Nuclear Weapons.
- 4.9. Nuclear weapons will be transported as determined by the Combatant Commander or the Military Department, in accordance with DoD Instruction 4540.05, Logistic Transportation of Nuclear Weapons. Additionally, the following safety guidance applies:
- 4.9.1. Movement(s) will be kept to a minimum consistent with operational requirements.
  - 4.9.2. Custody and accountability transfers during logistic movements shall be by courier receipt system to ensure positive control.
- 4.10. Permissive Action Link (PAL) operations shall be in accordance with plans and procedures prescribed by the applicable Combatant Command and technical publications.
- 4.11. Verification that a nuclear warhead is not present in a test assembly must be made utilizing nonnuclear assurance procedures at the last practical opportunity agreed upon by the Department of Defense and/or DOE before the conduct of an operational test.
- 4.12. Deviations from safety rules are permitted in an emergency, except as follows:
- 4.12.1. Nuclear weapons shall not be expended unless a valid, properly authenticated nuclear control order conveying release or expenditure authority is received. U.S. custody must be maintained until receipt of a valid nuclear control order that permits transferring U.S. nuclear weapons to non-U.S. delivery forces.
  - 4.12.2. Jettisoning of nuclear weapons is permitted in the event of an emergency, and is to be accomplished according to plans and procedures prescribed for the area of operations.

NOTE: DoD Directive 3150.2, DoD Nuclear Weapon System Safety Program, 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."

## **5. Specific Guidance.**

- 5.1. Do not fly the weapon system until authorized.
- 5.2. Nuclear weapons may be used for exercises when their use is specifically authorized by Commander, Air Force Global Strike Command or designated authority except as restricted elsewhere in this instruction.

5.3. These rules, weapon system features, operational controls, and technical procedures, ensure that US strategic bombers meet the Nuclear Weapon System Safety Standards in AFI 91-101, Air Force Nuclear Weapons Surety Program, and DoD Directive 3150.2, DoD Nuclear Weapon System Safety Program.

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

5.5. Do not load nuclear and conventional weapons on the same aircraft.

5.6. The following weapons are authorized:

5.6.1. B-2A:

5.6.1.1. B61-7, -11

5.6.1.2. B83-1

5.6.2. B-52H:

5.6.2.1. AGM-86B/W80-1

5.6.2.2. B61-7

5.6.2.3. B83-1

## **6. Nuclear Identification:**

6.1. Ensure there is a clear distinction between nuclear munitions/missiles/bombs and nonnuclear devices (for example, test and training shapes) intended to resemble nuclear weapons.

6.2. Ensure procedures are implemented to clearly differentiate AGM-86B missile(s) that have a nuclear warhead installed from those that do not.

6.3. Ensure procedures are implemented to clearly differentiate a warhead shipping and storage container that has a nuclear warhead from one that does not.

**7. Nonnuclear Assurance.** 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 DOE before an operational test. This applies to test assemblies which:

7.1. Resemble War Reserve assets, and

7.2. Will be flown on a combat delivery aircraft.

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

8.1. Do not use nuclear weapons to troubleshoot faults.

8.2. Use only equipment (e.g. hardware, software, etc.) and procedures that are consistent with US Air Force-approved publications for nuclear weapons or nuclear weapon system operations.

8.3. Training is prohibited with nuclear weapons-loaded aircraft. This includes simulation and partial simulation mode training.

8.4. The offices of primary responsibility for publications must ensure applicable publications conform to weapon system safety rules and meet the DoD nuclear weapon system safety standards.

8.5. Do not modify the Aircraft Monitoring and Control system, suspension or release systems, associated handling and test equipment, or any other aircraft system that affects nuclear surety without Air Force Safety Center approval IAW procedures as outlined in applicable Air Force instructions.

**9. Security Criteria.** AFI 31-101, The Air Force Installation Security Program; DoD S-5210.41-M, Nuclear Weapon Security Manual (U); and AFMAN 31-108, Nuclear Weapon Security Manual (U) (AF Supplement) apply.

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

10.1. A B-52H aircraft with an operationally coded Code Enable Switch (CES) loaded and sealed is a critical component and handled IAW AFI 91-105, Critical Components.

10.2. A B-2A with operational code material loaded and sealed is a critical component and handled IAW AFI 91-105, Critical Components.

**11. Personnel Reliability.** AFMAN 10-3902, Nuclear Weapon Personnel Reliability Program, and DoD Instruction 5210.42, Nuclear Weapon Personnel Reliability Program (PRP), apply.

**12. Weapon Safety Verifications.** Using applicable technical orders, verify that the AGM-86B/W80-1 is safe. The proper safe configuration is:

12.1. AGM-86B/W80-1:

12.1.1. Warhead Arming Device (WAD) safing pin is installed and the WAD indicates safe (white "S" on green background).

12.1.2. Rotary separation switch pin is installed (red band is not visible). Remove only when authorized by applicable technical data.

**13. Basic Aircraft Configurations:**

13.1. B-2A. Retain these configurations:

13.1.1. Rotary Launcher Assembly (RLA) mated with B61-7, B61-11, and/or B83-1 bombs. Mixed nuclear loads are authorized.

13.1.1.1. Weapon Jettison Panel:

13.1.1.1.1. ALL ENBL switch in the OFF position with guard cover down.

13.1.1.1.2. SEL ENBL switch in the OFF position with guard cover down.

13.1.1.2. Pilot's Consent Panel:

13.1.1.2.1. NUC UNLK ENBL switch in the OFF position with guard cover down, safety wired, and sealed.

13.1.1.2.2. NUC PA ENBL switch in the OFF position with guard cover down, safety wired, and sealed.

13.1.1.3. Mission Commander's Consent Panel:

13.1.1.3.1. NUC UNLK ENBL switch in the OFF position with guard cover down, safety wired, and sealed.

13.1.1.3.2. NUC PA ENBL switch in the OFF position with guard cover down, safety wired, and sealed.

13.2. B-52H. Retain these configurations:

13.2.1. Install operationally coded Code Enable Switch and disable the Interconnecting Box, unless in receipt of valid execution order prior to aircraft generation.

13.2.2. Aircraft with Common Strategic Rotary Launcher (CSRL) mated with B61-7 and/or B83-1 Gravity Bombs or AGM-86B/W80-1 Missiles:

13.2.2.1. Pilot's Missile/Munitions Consent Panel:

13.2.2.1.1. Off/Prearm switch in the OFF position with the cover down, safety wired, and sealed.

13.2.2.1.2. Lock/Unlock switch in the LOCK position with the cover down, safety wired, and sealed.

13.2.2.2. Weapon Control Panel:

13.2.2.2.1. Nuclear Lock/Unlock switch in the LOCK position with the cover down, safety wired, and sealed.

13.2.2.2.2. Nuclear Prearm Enable/Off (PA ENBL/OFF) switch in the OFF position with cover down, safety wired, and sealed.

13.2.2.2.3. Weapon Jettison Select/Normal (SEL/NORM) switch in the NORM position with cover down, safety wired, and sealed.

13.2.3. Aircraft with Pylon-Carried AGM-86B/W80-1 (with or without CSRL):

13.2.3.1. Release Circuits Disconnect (RCD) disconnected with the cover closed, safety wired, and sealed.

13.2.3.2. The guards on the left and right Pylon Jettison Consent switches down, safety wired, and sealed.

13.2.3.3. Pylon jettison control indicators show PYLON LOCKED

13.2.3.4. Pilot's Missile/Munitions Consent Panel:

13.2.3.4.1. Off/Prearm switch in the OFF position with the cover down, safety wired, and sealed.

13.2.3.4.2. Lock/Unlock switch in the LOCK position with the cover down, safety wired, and sealed.

13.2.3.5. Weapon Control Panel:

13.2.3.5.1. Nuclear Lock/Unlock switch in the LOCK position with the cover down, safety wired, and sealed.

13.2.3.5.2. Nuclear Prearm Enable/Off (PA ENBL/OFF) switch in the OFF

position with cover down, safety wired, and sealed.

13.2.3.5.3. Pylon Lock/Unlock switch in the LOCK position with the cover down, safety wired, and sealed.

13.2.3.5.4. Weapon Jettison Select/Normal (SEL/NORM) switch in the NORM position with cover down, safety wired, and sealed.

#### **14. Cruise Missile Operations:**

##### 14.1. Mission Planning:

14.1.1. Develop mission profiles so that the required g-maneuver occurs as late in the mission as practical.

14.1.2. Mission planning system operations must ensure that all missions against preplanned targets terminate within the target area.

##### 14.2. Fueling:

14.2.1. Perform fueling and defueling operations in the Integrated Maintenance Facility's (IMF) fueling room only.

14.2.2. If fuel is in the fuel set, only perform operations involving the missile's fuel system or the fuel set in the IMF fueling room.

14.2.3. When fuel is in the fuel set, close fuel room doors. EXCEPTIONS: The automatic fire door may be open. Personnel access doors may be opened to enter and exit.

#### **15. Storage, Maintenance, Testing, Ground Transportation, Mating, Demating, Loading and Unloading:**

15.1. Use applicable technical data to verify weapon condition, as required (paragraph 12).

15.2. Store nuclear weapons in US Air Force-approved, locked, and secured facilities. Nuclear weapons operations and storage in the IMF must be kept to the absolute minimum consistent with operational requirements.

15.3. With missiles on a pylon, install the ejector safing pin. When pylons are installed on the aircraft, ensure pylon jettison safing pins are installed (Remove only when authorized by applicable technical data.)

15.4. For rotary launchers, verify CSRL/RLA ejector safing mechanism lockpin is engaged and CSRL/RLA ejector safing mechanism levers indicate locked.

15.5. Fuel aircraft for the assigned mission before loading nuclear weapons.

15.6. Do not load an aircraft unless it is capable of performing its assigned mission.

**16. Logistics Movement of Nuclear Weapons by Cargo Aircraft:** Perform in accordance with AFI 91-115, Safety Rules for Nuclear Logistics Transport by Prime Nuclear Airlift Force.

#### **17. Ground Operations Involving Nuclear Weapon-Loaded Aircraft:**

17.1. Maintain aircraft in their basic configuration (paragraph 13).

17.2. Electrically verify safe status of the weapons with the applicable aircraft stores management system after weapons upload.

17.3. After completing the upload and postload functions, apply power to an uploaded nuclear weapon only for authorized permissive action link (PAL) operations, command disable (CD) operations, or to monitor the weapon. NOTE: Keep weapon monitoring to a minimum.

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

17.4.1. Perform maintenance or preflight operations.

17.4.2. Monitor the weapons or ejector rack locks.

17.4.3. Start or run engines.

17.4.4. Monitor the radio.

17.4.5. Perform authorized PAL, CD, or coded switch operations.

17.5. Do not start or run engine(s) unless:

17.5.1. Checking aircraft status.

17.5.2. Performing minor maintenance.

17.5.3. Conducting practice alerts, exercises, inspections, evaluations, taxiing, and flying operations.

17.6. Engine starts and engine runs must:

17.6.1. Be kept to a minimum.

17.6.2. Be done by at least two authorized and qualified aircrew members (Two-Person Concept applies).

17.7. Aircraft towing:

17.7.1. Keep towing to a minimum

17.7.2. Two authorized and qualified individuals must be in the cockpit during towing (Two-Person Concept applies).

17.8. Taxi.

17.8.1. Keep taxiing to the minimum consistent with operational requirements. Taxi aircraft, if necessary, only for practice alerts, exercises, inspections or evaluations, flying operations, and increased alert postures.

17.8.2. At least two authorized and qualified aircrew members must be in the aircraft during taxiing (Two-Person Concept applies).

17.9. Perform fuel management actions on loaded aircraft only as necessary to support a particular aircraft's assigned mission.

17.10. After weapons are loaded, only routine servicing and minor maintenance of the aircraft are authorized.

17.11. Use applicable technical orders to conduct maintenance and weapon load changes.



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

## 18.1. Conduct only when:

18.1.1. Directed by appropriate authority.

18.1.2. PAL is locked.

18.1.3. The aircraft is in its basic configuration (paragraph 13).

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

18.3. If loss of the aircraft is anticipated, Command Disable the weapons if the aircraft is capable and time and conditions permit.

## 18.4. B-2A:

18.4.1. Retain Command Disable capability.

18.4.2. When authorized to jettison weapons, break the locking/release system safety wires and seals and operate the controls by following applicable technical orders. Command Disable weapons if time and conditions permit.

## 18.5. B-52H:

18.5.1. With bombs mated to a CSRL, or cruise missiles loaded, disconnect the CES and attach the connector to the storage receptacle.

18.5.2. When authorized to jettison weapons, break the locking/release system safety wires and seals and operate the controls by following applicable technical orders.

18.5.3. Do not apply missile power. Keep application of missile interface unit power to a minimum.

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

## 19.1. Conduct only when:

19.1.1. Directed by appropriate authority.

19.1.2. Launch for survival has been ordered under positive threat of imminent attack.

19.1.3. Authorized to fly in a strike configuration as part of a deployment or dispersal.

## 19.2. Keep nuclear weapons in a safe configuration until authorized to prearm.

19.3. Keep the aircraft in its basic configuration (paragraph 13) until authorized to prepare weapons for release.

19.4. When authorized to jettison weapons, break the locking/release system safety wires and seals. If the aircraft is capable and time and conditions permit, ensure PAL is locked (B-2A only) and Command Disable the weapons. Operate the controls by following approved checklists.

19.5. Do not operate the safety-wired controls required for a prearmed release or enter the Unique Signal Generator (USG) code until authorization to expend nuclear weapons is received and weapon preparation for release checklist is required.

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

19.7. If loss of the aircraft is anticipated, relock PAL and Command Disable the weapons if the aircraft is capable and time and conditions permit.

**20. Coded Switch Procedures.** Use plans and procedures prescribed by proper authorities.

**21. PAL Procedures:**

21.1. Use PAL codes and PAL controllers only as directed by appropriate authority.

21.2. For aircraft with cockpit PAL control, relock PAL if a strike mission is terminated or recalled.

**22. CD Procedures.** Use CD codes and CD equipment only as directed by appropriate authority.

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

DoD Directive 3150.2, DoD Nuclear Weapon Systems Safety Program, 23 December 1995

DoD 3150.2-M, DoD Nuclear Weapon System Safety Program Manual, 23 December 1995

DoD Instruction 4540.05, Logistic Transportation of Nuclear Weapons, 23 June 2011

DoD Directive S-5210.41, Security Policy for Protecting Nuclear Weapons, 1 November 2004

DoD S-5210.41-M, Nuclear Weapon Security Manual (U), and Air Force Supplement, 1 November 2004

DoD Instruction 5210.42, Nuclear Weapon Personnel Reliability Program, 16 October 2006

AFPD 91-1, Nuclear Weapons and Systems Surety, 13 December 2010

AFPD 13-5, Nuclear Enterprise, 6 July 2011

AFI 21-204, Nuclear Weapons Maintenance Procedures, 30 November 2009

AFI 31-101, The Air Force Installation Security Program, 8 October 2009

AFI 91 -101, Air Force Nuclear Weapons Surety Program, 13 October 2010

AFI 91 -102, Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety Rules, 28 July 2004

AFI 91 -104, Nuclear Surety Tamper Control and Detection Programs, 10 September 2010

AFI 91-105, Critical Components, 7 January 2011

AFI 91-115, Safety Rules for Nuclear Logistics Transport by Prime Nuclear Airlift Force, 8 September 2009

AFMAN 91 -119, Safety Design and Evaluation Criteria for Nuclear Weapon Systems Software, 1 February 1999

AFI 91-204, Safety Investigations and Reports, 24 September 2008

AFMAN 10-3902, Nuclear Weapon Personnel Reliability Program, 13 November 2006

AFMAN 31-108, Nuclear Weapons Security Manual, 17 June 2011

AFRIMS RDS, at <https://www.my.af.mil/afirms/afirms/afirms/rims.cfm>

Adopted Forms

AF IMT 847, Recommendation for Change of Publication,

***Abbreviations and Acronyms***

**AFMC**—Air Force Materiel Command

**CD**—Command Disable

**CSRL**—Common Strategic Rotary Launcher

**DoD**—Department of Defense  
**EAP**—Emergency Action Procedures  
**EWO**—Emergency War Orders  
**IMF**—Integrated Maintenance Facility  
**JCS**—Joint Chiefs of Staff  
**JS**—Joint Staff  
**MAJCOM**—Major Command  
**OPR**—Office of Primary Responsibility  
**PAL**—Permissive Action Link  
**PRP**—Personnel Reliability Program  
**RCD**—Release Circuits Disconnect  
**RLA**—Rotary Launcher Assembly  
**RDS**—Records Disposition Schedule  
**SecDef**—Secretary of Defense  
**USG**—Unique Signal Generator  
**WAD**—Warhead Arming Device