

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

**AIR FORCE INSTRUCTION 91-104**

**23 APRIL 2013**



**Safety**

**NUCLEAR SURETY TAMPER CONTROL  
AND DETECTION PROGRAMS**

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This Instruction implements AFD 91-1, *Nuclear Weapons and Systems Surety*. This publication is consistent with AFD 13-5, *Air Force Nuclear Enterprise*. It provides guidance on setting up procedures for nuclear surety tamper control through the Two-Person Concept and for tamper detection through approved nuclear component sealing methods. It applies to all Air Force units with a mission involving operations, maintenance, security, or logistics movement of nuclear weapons or certified critical components. It also applies to all Air Force units responsible for sealing requirements according to applicable safety rules for nuclear weapon systems or the handling and storage procedures for certified critical components. This Instruction also applies to the Air Force Reserve and Air National Guard of the United States performing nuclear duties. This Instruction sets forth guidance regarding nuclear surety tamper control and detection programs managed by Air Force civilian and military personnel, including the Air Force Reserve and Air National Guard. Failure to observe prohibitions and mandatory provisions of this directive in paragraphs 1.2., 1.3., 1.4., 3.4. and associated sub-paragraphs of those stated, by military personnel is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Violations may result in administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions for violations of related laws. 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://my.af.mil/afirms/afirms/afirms/rims/cfm>. This Instruction requires collecting and maintaining information protected by the *Privacy Act of 1974* authorized by 10 U.S.C. 8013. The applicable Privacy Act System Notice, Serious Incident Reports (June 11, 1997, 62 FR 31793), is available online at:

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## **SUMMARY OF CHANGES**

This publication has been revised to make administrative changes and to reflect organizational changes since the last publication of this Instruction. This publication must be completely reviewed.

### **1. Requirements and Procedures.**

1.1. Tamper Control Program. The Two-Person Concept (TPC) is central to nuclear surety tamper control measures in the Air Force. It is designed to make sure that a lone individual cannot perform an incorrect act or unauthorized procedure on a nuclear weapon, nuclear weapon system, or certified critical component.

1.2. Concept Enforcement. Each organization with a mission or function involving nuclear weapons, nuclear weapon systems, or certified critical components:

1.2.1. Identifies no-lone zones (where at least two authorized persons must be present during any operation or task).

1.2.2. Enforces the Two-Person Concept.

1.2.3. Develops procedures to limit entry to authorized persons who meet the requirements of paragraph 1.3.

1.3. Team Requirements. (Refer to paragraph 1.6.1 for criteria on foreign nationals.) A Two-Person Concept team consists of at least two individuals who:

1.3.1. Are certified under the Personnel Reliability Program (PRP), as specified in DoD 5210.42-R\_AFMAN 10-3902, *Nuclear Weapons Personnel Reliability Program*.

1.3.2. Know the nuclear surety requirements of the task they perform.

1.3.3. Can promptly detect an incorrect act or unauthorized procedure.

1.3.4. Have successfully completed nuclear surety training according to AFI 91-101, *Air Force Nuclear Weapons Surety Program*.

1.3.5. Are designated to perform the required task.

1.4. Two Person Concept Violations. Report a Two-Person Concept violation when a lone individual in a no-lone zone has the opportunity to tamper with or damage a nuclear weapon, nuclear weapon system, or certified critical component. Refer to AFMAN 91- 221, *Weapons Safety Investigations and Reports*, for reporting guidance.

**NOTE:** If TPC is maintained by more than two persons, a lone individual may be temporarily obscured from sight or not directly observed by the remaining TPC team if the lone individual is in a location that would preclude the ability to perform an incorrect act or unauthorized

procedure that could affect the nuclear weapons, the weapon system, or critical components (i.e. There is no violation of the two-person concept). However, the TPC team must maintain awareness of the location and justification for the lone individual to be temporarily out of sight (e.g., an individual whether on PRP or non-PRP under escort, may enter a lavatory or other sealed compartment within a no-lone zone without continuous direct observation by the remaining TPC team as long as that compartment does not afford access as previously described).

A momentary breach of the no-lone zone is not a violation if no individual had the opportunity to perform an incorrect act or unauthorized procedure. In performing certain tasks, team members may lose sight of each other or be far apart. One team member may be briefly out of sight to perform a specific task if it is unsafe or physically impossible to maintain constant observation.

1.5. Authorized Deviations. You may deviate from the Two-Person Concept when:

1.5.1. The nuclear Weapon System Safety Rules (WSSR) specifically authorize a deviation.

1.5.2. An emergency presents an immediate threat to the safety of personnel or the security of a nuclear weapon, nuclear weapon system, or certified critical component. War plan exercises are not considered emergencies.

1.6. Additional Conditions:

1.6.1. Non-US Personnel. Per AFI 91-112, *Safety Rules For US/NATO Strike Fighters*, for US custodial units at allied installations, foreign nationals may be part of a Two-Person Concept, and host nations will implement equivalent personnel reliability programs.

1.6.2. Entry Control Personnel. The Two-Person Concept applies to individuals who control entry into a no-lone zone. Entry controllers may not form a Two-Person Concept team with personnel inside the no-lone zone.

1.6.3. Couriers. Couriers ensure that the host installation meets Two-Person Concept requirements and no-lone zones are delineated around nuclear logistics aircraft.

1.6.4. PRP Interim-Certified Personnel Restrictions. Two interim-certified individuals may not form a Two-Person Concept team. Also, an interim-certified member may not pilot a single-seat aircraft loaded with nuclear weapons.

1.6.5. Nonqualified Personnel. An individual who does not qualify as a member of a Two-Person Concept team may enter a no-lone zone to perform a specific task only if escorted by a Two-Person Concept team. Escorts should be capable of detecting incorrect acts or unauthorized procedures. Escort procedures will be accomplished in accordance with the applicable directive(s) governing the nuclear weapon system or critical component defining the no-lone zone.

## 2. Tamper Detection Program.

2.1. Sealing Requirements. Certain items must be sealed because either:

2.1.1. Air Force nuclear WSSRs require it, or,

2.1.2. In the case of some certified critical components, seals protect their certification status while in storage or during transportation, as specified in AFI 91-105, *Critical Components*

2.2. Sealing Methods. Authorized sealing methods include:

2.2.1. Safety Wiring and Sealing. Two types of seals are authorized using this method. The first method consists of seals composed of a malleable material installed with a crimping device and controlled die to form an impressed distinctive mark or unique identifier. The second method consists of seals applied with self-locking, non-reversible feature with a singularly unique serial number/alpha, color control system. Both types of seals are used with safety wire connected to certain switches, covers, handles, or levers. Breakage or alteration of the wire or seal provides evidence/detection of possible unauthorized acts, access or tampering. Use this method only in no-lone zones.

2.2.2. Tamper Detection Indicators (TDI). In this method, an approved TDI is placed so it will indicate if someone has activated, or had access to the interior of a certified critical component. Once the TDI is installed, evidence of tampering is visible to the naked eye or can be detected using special equipment.

2.2.2.1. TDI and other authorized sealing methods proposed for use in nuclear weapons systems will be properly certified prior to use according to AFI 63-125, *Nuclear Certification Program*.

### 3. Responsibilities.

3.1. Air Force Chief of Safety (AF/SE) oversees the Air Force Nuclear Surety Tamper Control and Detection Programs. Acting for AF/SE, the Chief of the Weapons Safety Division manages the programs and certifies the design safety features of sealing methods proposed for use in nuclear weapon systems according to AFI 91-103, *Air Force Nuclear Safety Design Certification Program*.

3.2. Nuclear Weapon System Safety Group (NWSSG) recommends sealing requirements in operational nuclear weapon systems and proposes specific nuclear weapon system safety rules, if necessary. (See AFI 91-102, *Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety Rules*.)

3.3. Major Commands:

3.3.1. Develop and publish Field publications, as needed, to implement and enforce the Air Force Nuclear Surety Tamper Control and Detection Programs throughout their commands.

3.3.2. Develop and distribute procedures for sealing, where appropriate. At a minimum, the procedural publication will:

3.3.2.1. State when and by whom seals can be applied and removed.

3.3.2.2. Establish controls for the handling, receipt, storage, issue, inventory, and disposal of TDIs (including all residue), controlled dies and self-locking, non-reversible seals (example: roto-seals).

3.3.2.3. Direct that TDIs, controlled dies and self-locking, non-reversible seals are stored and accounted for by individuals not responsible for their installation.

3.3.2.4. Direct personnel to comply with the following steps for malleable seals only:

3.3.2.4.1. Place a distinctive marking (determined locally) on malleable seals using a crimping device and die.

3.3.2.4.2. Be sure to destroy any distinctive markings on malleable seals after you remove them.

3.3.2.5. Direct personnel to verify seal integrity immediately following installation. *Note: For aircraft only, verify seals before and after any task or operation performed in the immediate area of the seal. Do not verify aircraft seals before an operation or task during alert crew member exercises or actual responses, but do verify the seals after the exercise or alert.*

3.3.2.6. Require periodic inspections of seals on nuclear weapon-loaded aircraft, missile systems, and certified critical components in storage or transport.

3.3.2.7. Require that only Two-Person Concept teams install seals and verify they remain intact.

3.3.2.8. Direct training of maintenance personnel, aircrews, missile combat crews, and other involved personnel to recognize distinctive marking or serial numbers of the seals.

3.3.2.9. Prescribe a course of action when an installed seal is found broken or shows evidence of tampering. At a minimum:

3.3.2.9.1. Investigate the event and send a mishap report according to AFMAN 91-221, *Weapons Safety Investigations and Reports*.

3.3.2.9.2. Establish procedures to maintain control of the system until situation is resolved.

3.3.2.9.3. Check the integrity of the weapon system and reseal if integrity is assured.

3.3.2.9.4. Prescribe a course of action when a seal is accidentally broken during authorized operations.

3.3.2.9.5. Ensure training seals can be easily distinguished from, and are not used as, operational seals.

#### 3.4. Two-Person Concept Team Responsibilities.

3.4.1. Enforce the Two-Person Concept while performing a task or operation and continue to enforce it until you are either relieved by authorized personnel or you have secured the nuclear weapon, nuclear weapon system, or certified critical component.

- 3.4.2. Take immediate, positive steps to prevent or stop an incorrect procedure or unauthorized act.
- 3.4.3. Report deviations immediately to the appropriate supervisor.

MARGARET H. WOODWARD  
Major General, USAF  
Chief of Safety

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

AFI 33-360, *Publications and Forms Management*, 7 February 2013

AFI 63-125, *Nuclear Certification Program*, 8 August 2012

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

AFMAN 33-363, *Management of Records*, 1 March 2008

AFI 91-102, *Nuclear Weapon System Safety Studies, Operational Safety Reviews, and Safety Rules*, 24 June 2010

AFI 91-103, *Air Force Nuclear Safety Design Certification Program*, 17 November 2010

AFI 91-105, *Critical Components*, 7 January 2011

AFI 91-112, *Safety Rules for US/NATO Strike Fighters*, 9 September 2009

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

DoD S-5210.41M\_AFMAN 31-108, *Nuclear Weapons Security Manual*, 13 July 2009

DoD 5210.42\_ AFMAN 10-3902, *Nuclear Weapons Personnel Reliability Program*, 13 November 2006

AFMAN 91-221, *Weapons Safety Investigations and Reports*, 8 November 2010

AFPD 13-5, *Air Force Nuclear Enterprise*, 6 July 2011

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

FF-S-2738A, *Tamper Seals*

***Adopted Forms***

AF Form 847, *Recommendation for Change of Publication*

***Abbreviations and Acronyms***

**AF**— Air Force

**AFI**— Air Force Instruction

**AFMAN**— Air Force Manual

**AFPD**— Air Force Policy Directive

**AFSEC/SEW**— Air Force Safety Center, Weapons Safety Division

**AFSEC/SEWN**— AFSEC/SEW, Nuclear Weapons Safety Branch

**AFSEC**— Air Force Safety Center

**AF/SE**— Air Force Chief of Safety

**NWSSG**— Nuclear Weapon System Safety Group

**WSSR**—Weapons System Safety Rule

**OPR**—Office of Primary Responsibility

**PRP**— Personnel Reliability Program

**RDS**—Record Disposition Schedule

**TDI**— Tamper Detection Indicators

**TPC**—Two Person Concept

**UCMJ**—Uniform Code of Military Justice